

DADCO®

Nitrogen Gas Spring Linked System Components

*Everything You Need to
Construct a Linked System*



Introduction

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. DADCO recommends choosing control panels and hose type based on port style, with complementary fittings and additional piping accessories, to design a linked system best suited for your application.

Port Style

M6 Mini Port



Gas Springs with M6 Port:

Micro Series

U.0175 – U.2600

L / LJ Series

SCR Series

FCL Series

90.10.00170

G 1/8 Large Port



Gas Springs with G 1/8 Port:

U.4600 – U.20000

UT / UH / UK Series

UX Series

90.8 Series

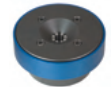
90.10.00500 – 90.10.10000

SC Series

ST = Surge
Tank Preferred



Surge Tanks
See pages 16-17



Tools
See pages 26-27



Control Panels
See pages 3-6



Distribution
Blocks
See page 7

Compatible Fitting Styles

Preferred

DADCO MINILink®
(M8 x 1)



See page 14

D-24 Tapered
(M12 x 1.5)



See page 13

Zip (CNOMO)
(S12.65 x 1.5)



See page 15

Preferred

O-Ring Face Seal (ORFS)
ST (9/16-18)



See pages 9-12

Hose System

90.700 (Y-700) Hose

Preferred

90.705 (Y-705) Hose



See page 8

90.500 (Y-500) Hose

Preferred



See page 8

90.400 (Y-400) Hose

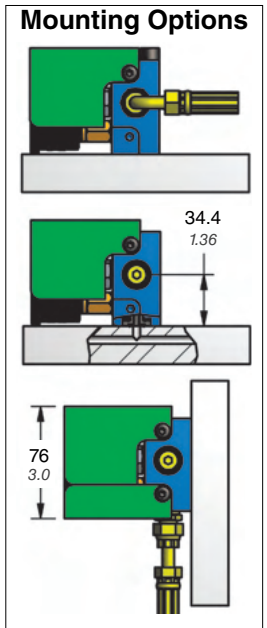
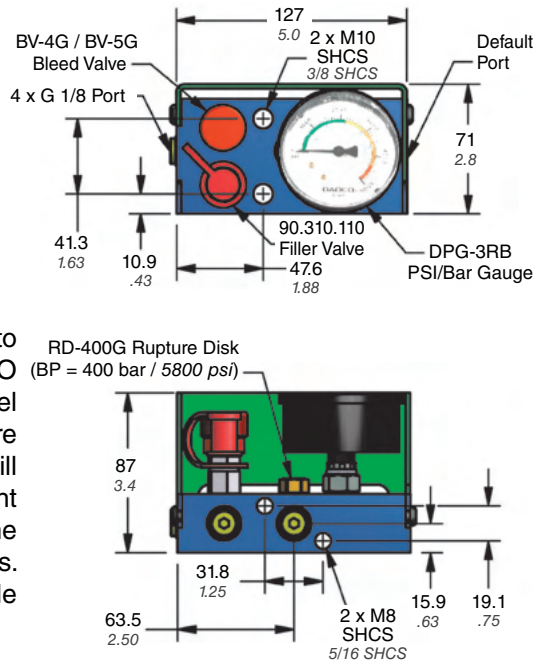
ST



See page 8

Components: Control Panels

Convertible Control Panel



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 BSP 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 (90.406)
Control Panel w/ Vibration Resistant Valve (90.406V)

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.

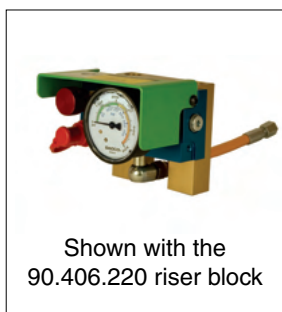
90.406. P 1 N

Fitting Connection

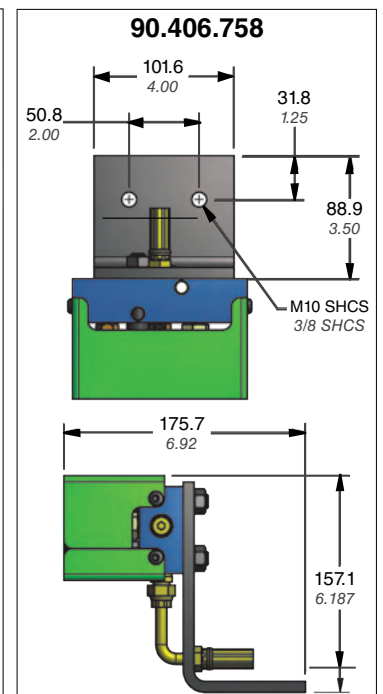
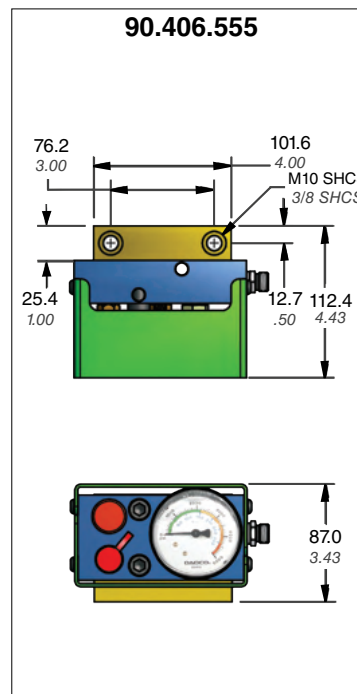
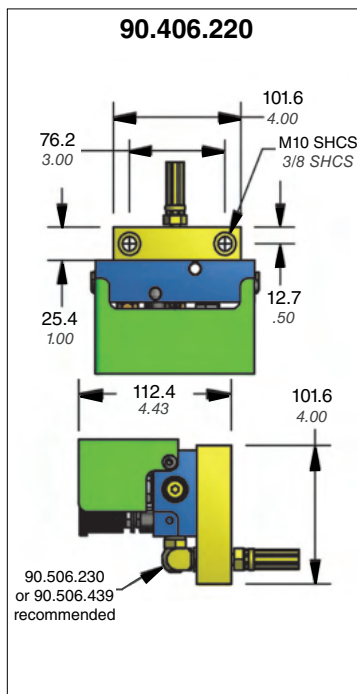
N = No Fitting Supplied,
 M = Manifold Seal,
 S = ORFS Fitting,
 D = D-24 Fitting,
 B = Zip Fitting,
 L = MINILink® Fitting
 When not specified, default is N.

Riser Block for Convertible Control Panel

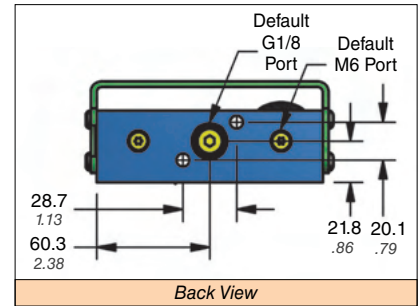
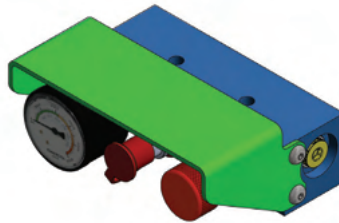
DADCO offers the 90.406.220, 90.406.555, and the 90.406.758 Riser Blocks for use with the Convertible Control Panel for maximum mounting versatility. It allows for easy mounting of the Control Panel to SMS® plates.



Shown with the 90.406.220 riser block



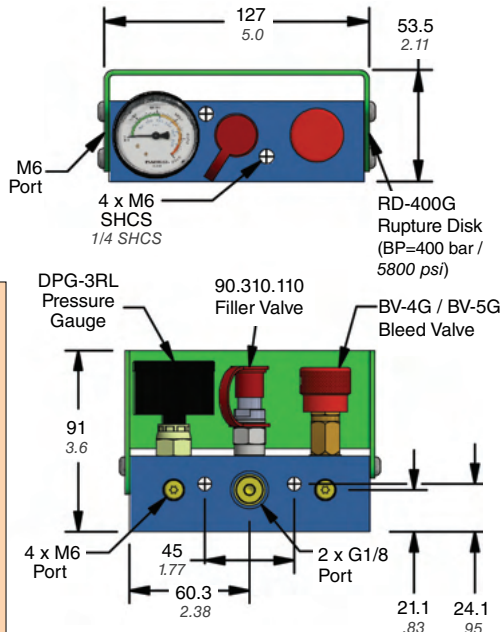
Mini Convertible Control Panel



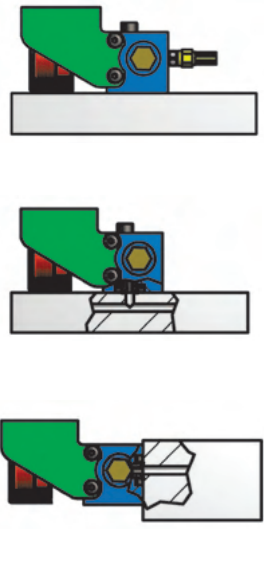
The DADCO Mini Convertible Control Panel is used to fill, drain and monitor the pressure of linked DADCO nitrogen gas springs from outside the die. The panel is compatible with SMS-i® and traditional linked systems and has five M6 ports, two G 1/8 ports, a high pressure gauge, a quick disconnect fill 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:

90.407. P N	Fitting Connection
Mini Control Panel (90.407)	N = No Fitting Supplied,
Min Control Panel w/ Vibration	M = Manifold Seal,
Resistant Valve (90.407V)	S = ORFS Fitting,
	D = D-24 Fitting,
	B = Zip Fitting,
	L = MINILink® Fitting
	When not specified, default is N.
Gauge Style	
PSI/Bar Gauge = P	
Bar/MPa Gauge = A	



Mounting Options



Vibration Resistant Bleed Valve

DADCO's new vibration resistant bleed valve (BV-5G) prevents unintended system exhaust resulting from excessive in-die vibration. Our innovative design allows the valve to remain closed when the knob is loose, preventing loss of gas due to vibratory loosening. This bleed valve may be ordered as a replacement for existing control panels, or it may be included on a newly purchased Mini Convertible (90.407V), or Standard Convertible Control Panel (90.406V). **NOTE:** The knob will be free to spin when closed. To prevent damage to the assembly, do not over tighten or use a wrench to open or close the bleed valve.



90.406V.P2N



90.407V.PN

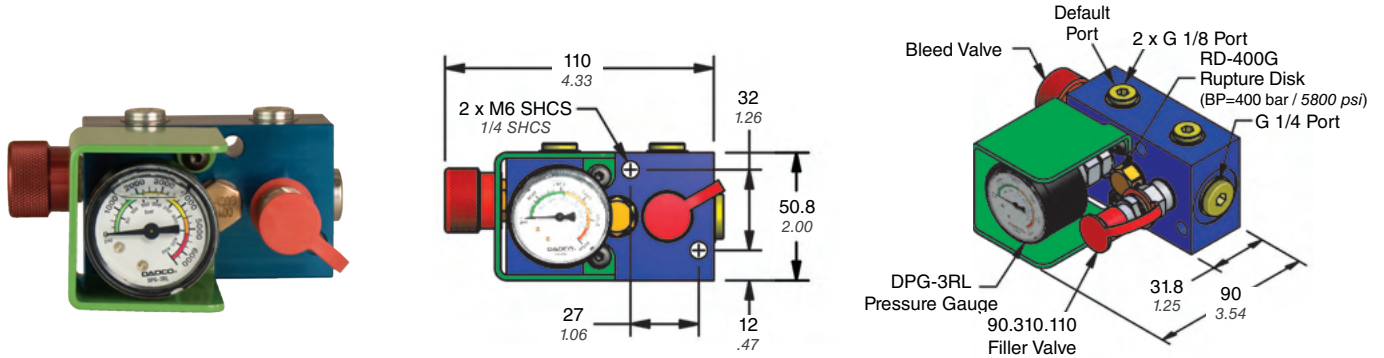
Ordering Example:

90.406V. P 1 N	Fitting Connection
Control Panel with Vibration	N = No Fitting Supplied,
Resistant Valve (BV-5G)	M = Manifold Seal,
Gauge Style	S = ORFS Fitting,
PSI/Bar Gauge (DPG-3RB) = P	D = D-24 Fitting,
Bar/MPa Gauge (DPG-3RM) = A	B = Zip Fitting,
	L = MINILink® Fitting
	When not specified, default is N.
Guard	
Top Guard = 1	
Top and Bottom Guards = 2	
When not specified, default is 1.	

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.



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.

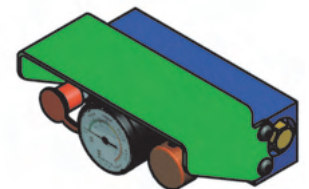
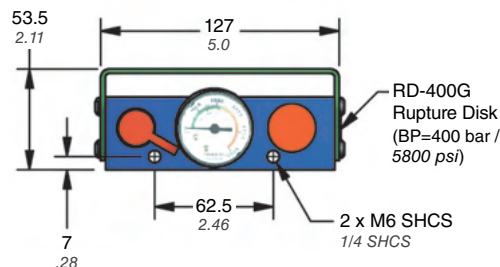
Pressure Monitor Sensor Options (optional)
 EDS, DSK, DPS, DPT, SKN
 More information on page 20.

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.

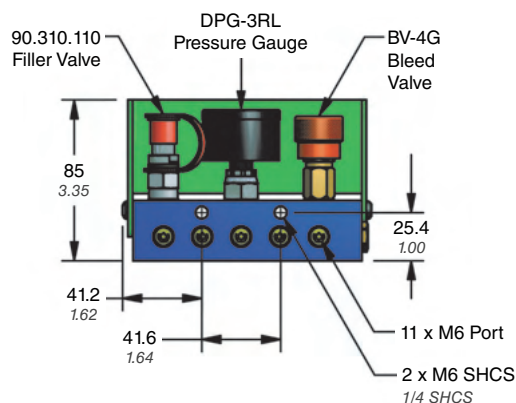
Mini Control Panel

90.407.11G

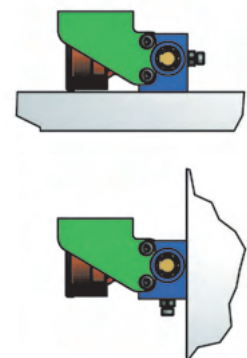
PHASING OUT



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 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.

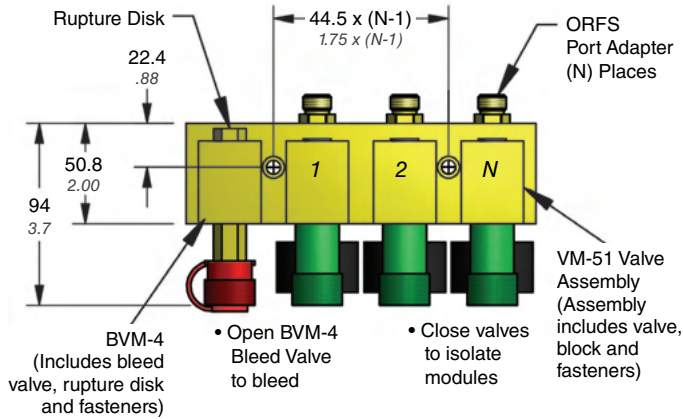


Mounting Options



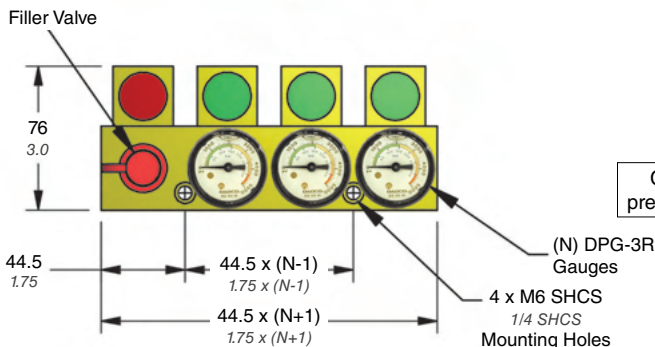
Multi Panel

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.

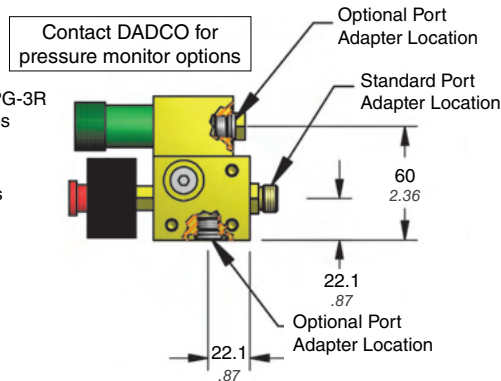
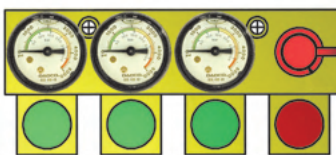


Features

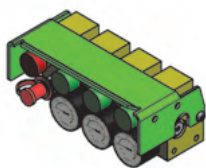
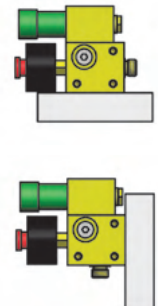
- Each module features a simple two position valve for easy operation.
- Three port locations on each module give maximum piping flexibility.
- Each module is supplied with a straight service fitting. (For unused ports, DADCO recommends closing the module off before filling or using tube end caps, 90.506.112, 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.



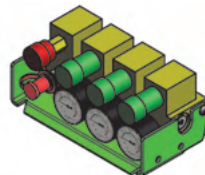
Reversed Mounting



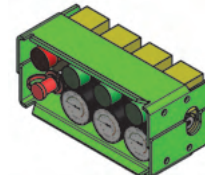
Mounting Options



Top Guard – 90.402



Bottom Guard – 90.403



Both Guards – 90.404

Ordering Example:

90.401. 3.

Guard Location:

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

For optional reversed mounting, add R.

Number of Modules:

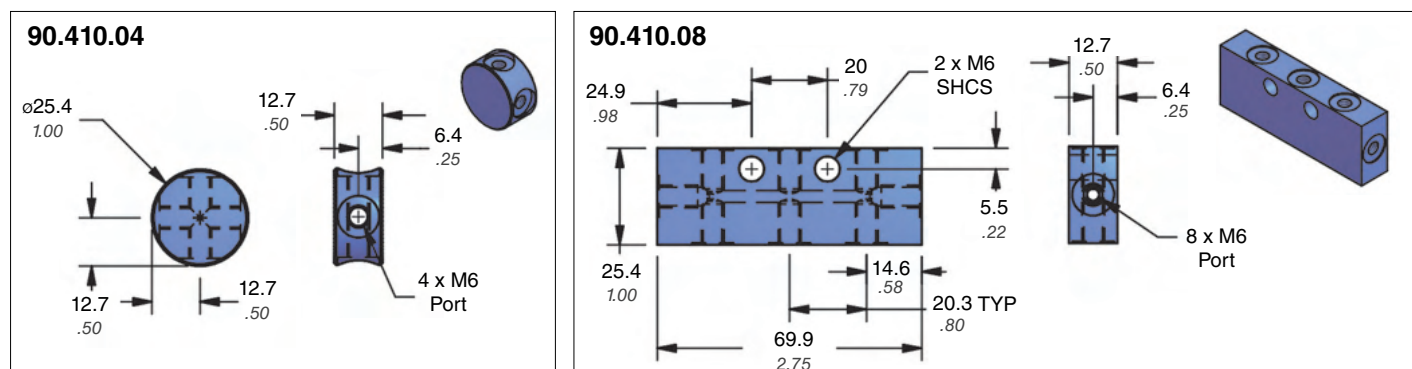
2-6, 8 or 10

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.

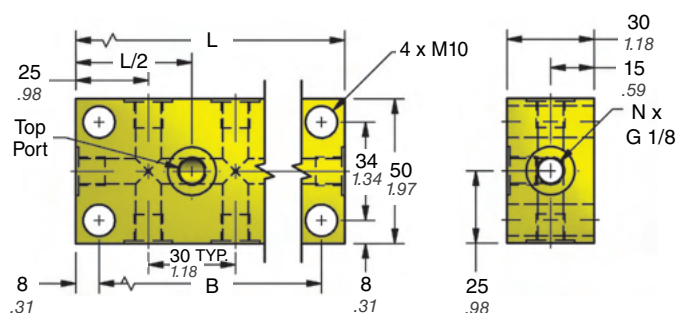
Mini M6 Distribution Blocks

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 Blocks have 7-12 G 1/8 ports. Plug unused ports with 90.505.110 Port Plug before charging the system.

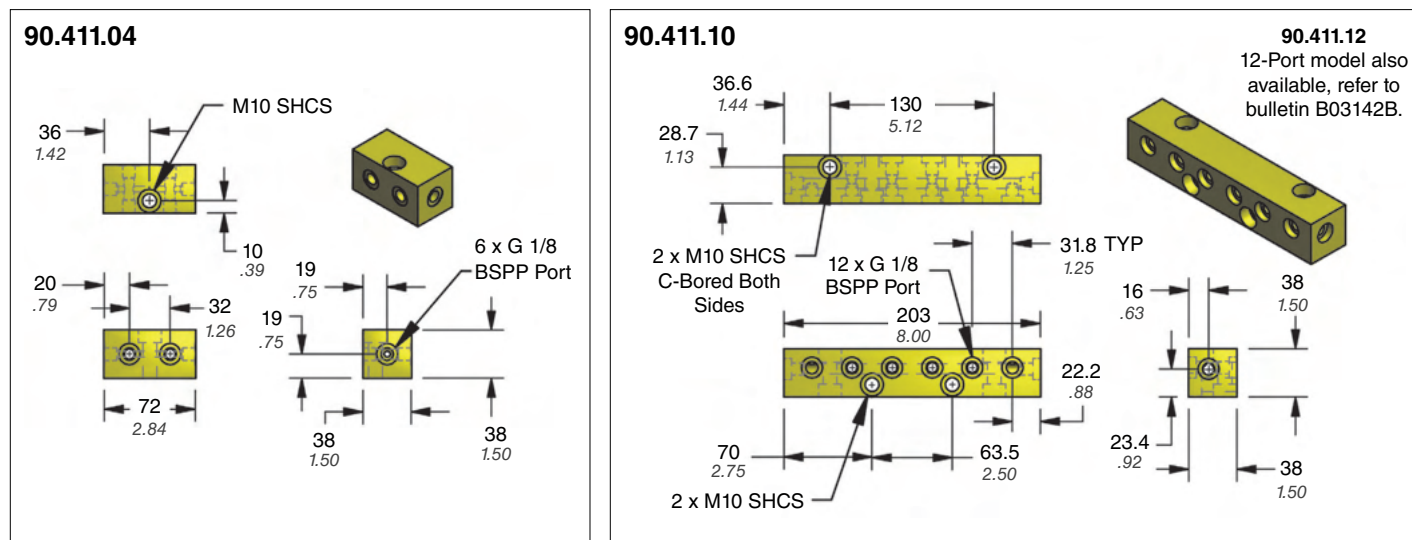


Model	N (Total Ports)	End Ports	Top Port	Side Ports	L	B
90.412.07	7	2	1	4	80 3.15	64 2.52
90.412.09	9	2	1	6	110 4.33	94 3.70
90.412.10	10	2	—	8	140 5.51	124 4.88
90.412.12	12	2	—	10	170 6.69	154 6.06

Standard G 1/8 Distribution Blocks

90.411.04 / 90.411.10 / 90.411.12

The Standard Distribution Blocks feature 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.



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

- + Compatible with Zip style fittings
- + Alternate to 90.700
- + Matches Toyota Standards
- Cannot be linked with a surge tank



DADCOFLEX® 90.500 (Y-500) Hose

Preferred

- + Compatible with ORFS and D-24 style fittings
- + Assemble in field without additional tools using 90.504.343 non-crimped adapter



DADCOFLEX® 90.400 (Y-400) Hose

ST

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



DF Tubing DF.

Length (mm)

- + Extremely durable and compact
- Dimensions critical, no flexibility

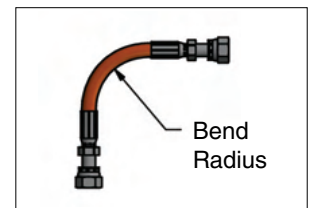
NOTE: To order straight lengths of DF Tubing, use the part number above. For curved pieces, it is necessary to provide a drawing. Refer to Bulletin B02118B for more information.



Part No.	OD	ID	Working Pressure	Burst Pressure	Bend Radius	Crimp Die	Crimp Diameter
• 90.700 (Y-700)	5 .20	2 .08	630 bar 9135 psi	1890 bar 27405 psi	20 .79	Mini-Crimp 90.710.8 No Ring Required	7.00 – 7.25 .276 – .285
90.705 (Y-705)	5 .20	2 .08	630 bar 9135 psi	1940 bar 28130 psi	20 .79		
• 90.500 (Y-500)	11 .43	5 .19	345 bar 5000 psi	1380 bar 20000 psi	38 1.50	80C-P03 Gray Die 82C-R01 Ring	12.19 – 12.70 .480 – .500
90.400 (Y-400)	13 .51	6.5 .25	345 bar 5000 psi	1380 bar 20000 psi	50 1.97	80C-P04 Red Die 82C-R01 Ring	14.22 – 14.73 .560 – .580
DF Tubing	6.4 .25	4.5 .18	260 bar 3750 psi	1000 bar 15000 psi	15.9 .625	Assembly at DADCO	Assembly at DADCO

• Preferred Sizes

DADCO offers hydraulically or pneumatically operated crimping units, turn to page 26 for more information.



Hose Assembly

A DADCO hose assembly consists of a length of hose with a hose adapter on each end. Refer to bulletin B21102 for more information on ordering a hose assembly.

Hose Assembly Ordering Example:

90.500. S843. S854. 600. I

Hose Type _____
(700, 705, 500, or 400)

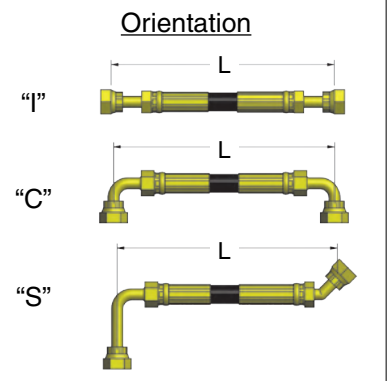
Hose Adapters _____

Sealing Type	Example
ORFS	S943
D-24	D843
Mini	L943
Zip	B943

Orientation
Hose adapter
orientation:
I, C or S

Length of Hose
Assembly (L) in mm
Distance between
sealing faces

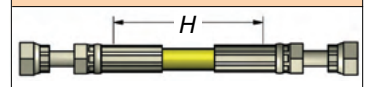
Reference appropriate sealing type prefix (S, D, L or B).



Components: ORFS Hose Adapters

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 8 with the adapters shown throughout this catalog. If the length of hose required is less than the H Value, use DF Tubing (page 8) or Solid Hose Fittings (page 11). DADCO also offers a variety of stainless steel fittings to be paired with Y-700 or Y-500 hose for linked operation in extreme condition environments.

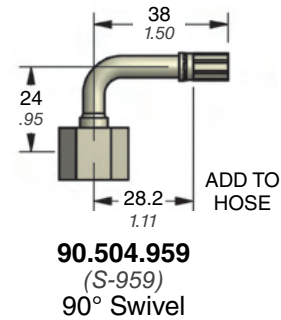
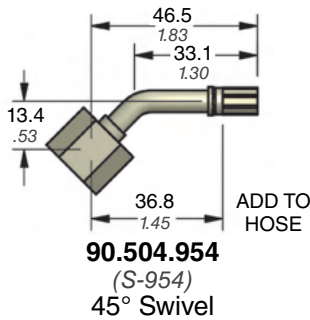
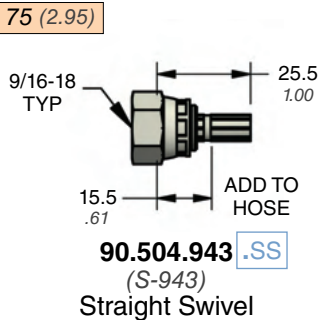
Minimum recommended hose length



[SS] = Stainless Steel Option Available

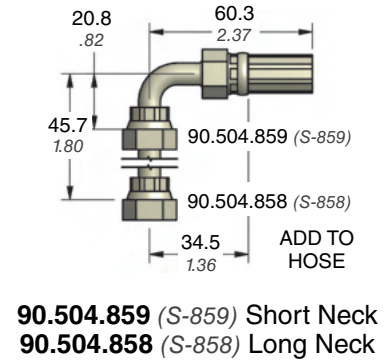
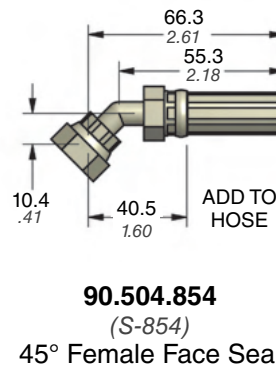
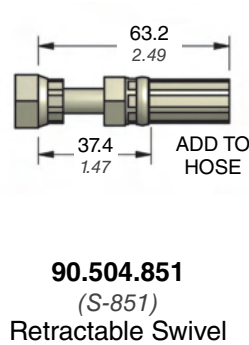
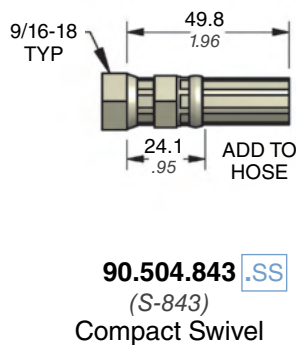
Crimped Hose Adapters for 90.700 or 90.705 (Y-700 or Y-705)

H Value = 75 (2.95)



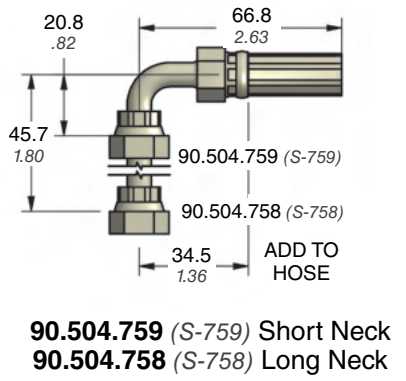
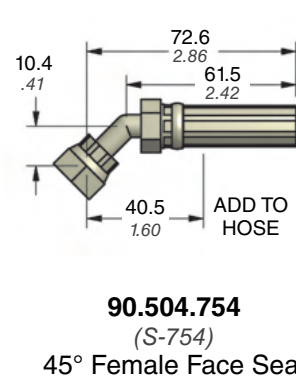
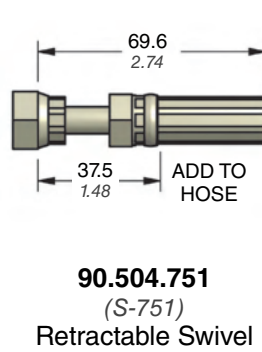
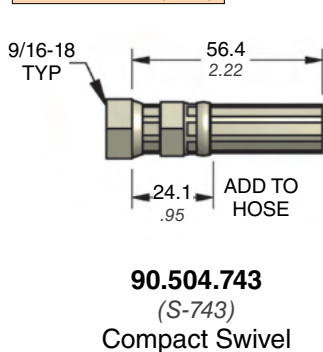
Crimped Hose Adapters for 90.500 (Y-500)

H Value = 80 (3.15)



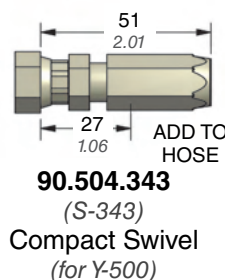
Crimped Hose Adapters for 90.400 (Y-400)

H Value = 85 (3.35)



Non-Crimped Hose Adapters for 90.500 (Y-500)

H Value = 85 (3.35)

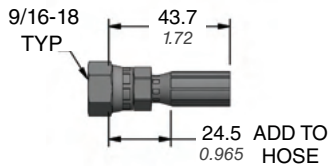


Compact ORFS Hose Adapters

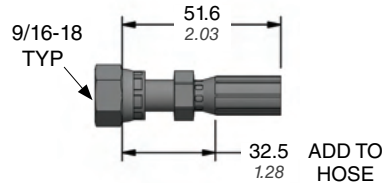
DADCO offers compact O-ring Face Seal (ORFS) hose adapters with a 9/16-18 thread and elastomeric seals at each joint to prevent loss of high pressure nitrogen gas. These hose adapters are more compact than the 90.504.700 and 90.504.800 series fittings, but are compatible with the fittings used with these series. DADCO recommends using DADCO brand hoses with the adapters shown below when linking DADCO nitrogen gas springs.

Compact Hose Adapters for 90.500 hose (Y-500)

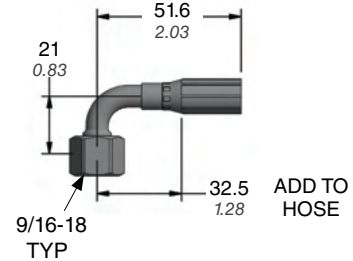
H Value = 70 (2.76)



90.504.543
(SK-543)
Compact Swivel



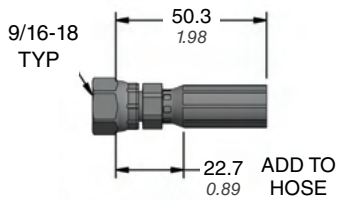
90.504.551
(SK-551)
Retractable Swivel



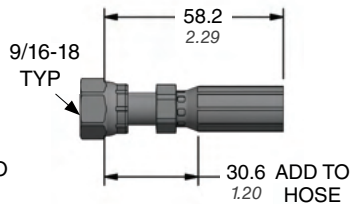
90.504.559
(SK-559)
90° Swivel

Compact Hose Adapters for 90.400 hose (Y-400) ST

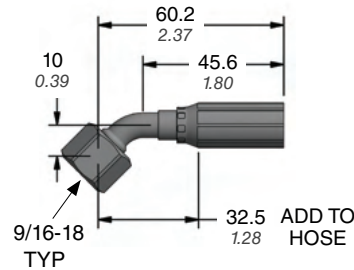
H Value = 75 (2.95)



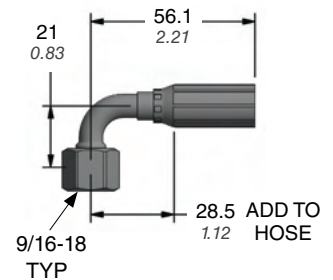
90.504.443
(SK-443)
Compact Swivel



90.504.451
(SK-451)
Retractable Swivel

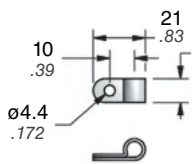


90.504.454
(SK-454)
45° Female Face Seal

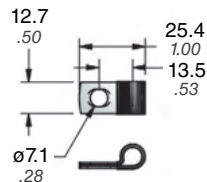


90.504.459
(SK-459)
90° Swivel

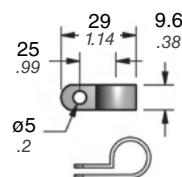
Hose Straps



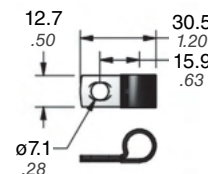
90.504.701 (HS-701)
for use with 90.700 and
90.705 hose types



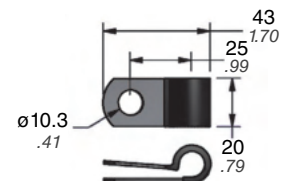
90.504.700 (HS-700)
for use with 90.700 and
90.705 hose types



90.504.250 (HS-250)
for use with 90.500 and
90.400 hose types



90.504.500 (HS-500)
for use with 90.500
hose type



90.504.400 (HS-400)
for use with 90.500 and
90.400 hose types

Components: ORFS Fittings

Solid Hose Fittings

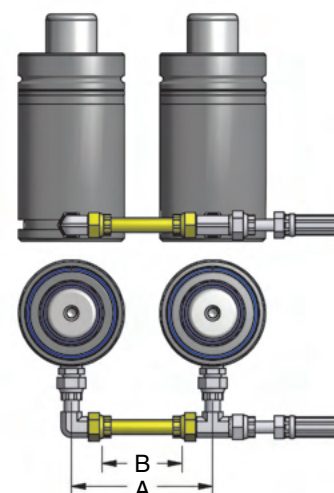
Solid hose fittings come in predetermined lengths and are ideal for limited space applications. They can replace traditional hose assemblies, particularly when the length of hose required is shorter than DADCO's recommended minimum hose length (see H Values on page 9-10). For custom lengths of solid hose, see DF Tubing on page 8.

Metric

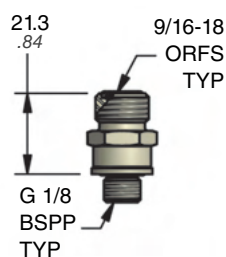
Part No.	A	B
90.503.xxxx (S-9xxx)	mm	A - 43.2
9075	75	31.8
9100	100	56.8
9120	120	76.8
9125	125	81.8
9130	130	86.8
9140	140	96.8
9150	150	106.8

English

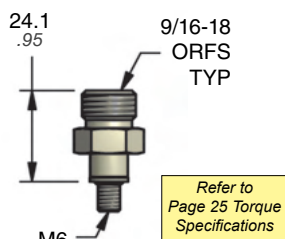
Part No.	A	B
90.503.xxx (S-8xx)	in.	A - 1.70
830	3.00	1.30
832	3.25	1.55
835	3.50	1.80
837	3.75	2.05
840	4.00	2.30
845	4.50	2.80
850	5.00	3.30
855	5.50	3.80
860	6.00	4.30



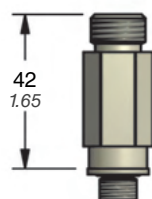
Port Adapters



90.505.115 .SS
(S-115)
Straight



90.505.116
(S-116)
M6 → 9/16-18

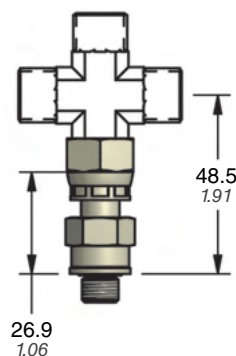


90.505.117
(S-117)
Extended Straight

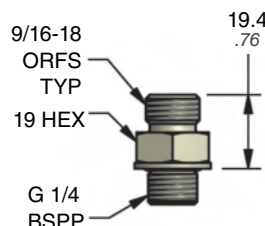
DADCO's O-Ring Face Seal (ORFS) Fittings have elastomeric seals at every joint.



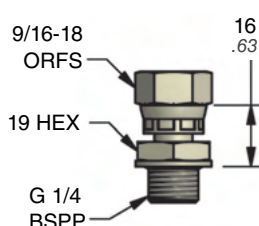
.SS = Stainless Steel Option Available



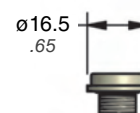
90.505.121
(S-121)
Swivel Straight



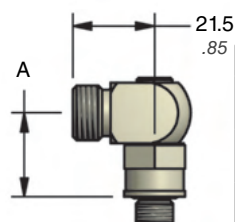
90.505.122
(S-122)
Straight



90.505.123
(S-123)
Swivel Straight

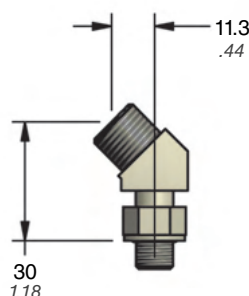


90.505.110
(G-109)
Flush Plug

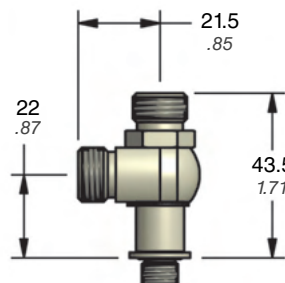


90.506.230
(S-230)
90° Elbow

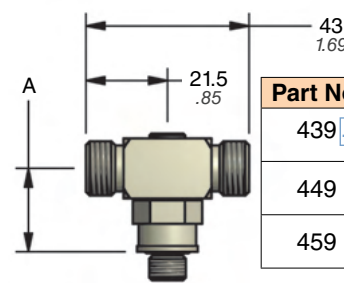
Part No.	A
230 .SS	22 .87
240	36 1.42
250	43 1.69



90.505.330
(S-330)
45° Elbow



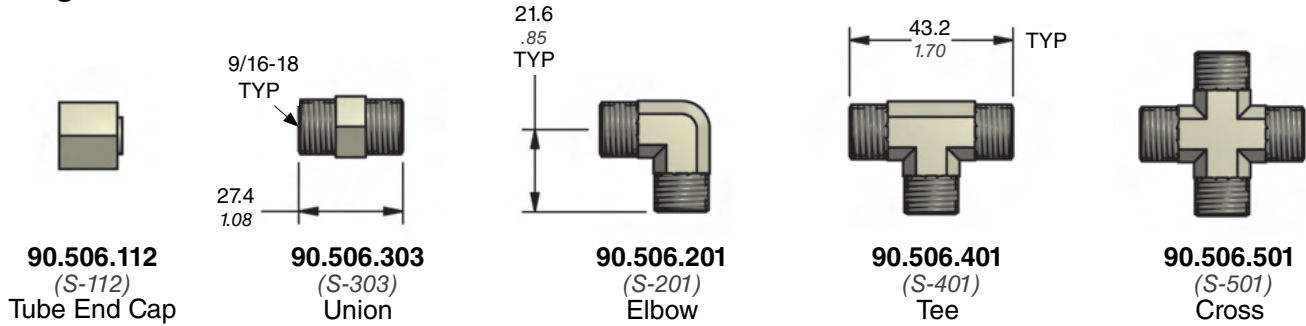
90.505.438
(S-438)
Run Tee



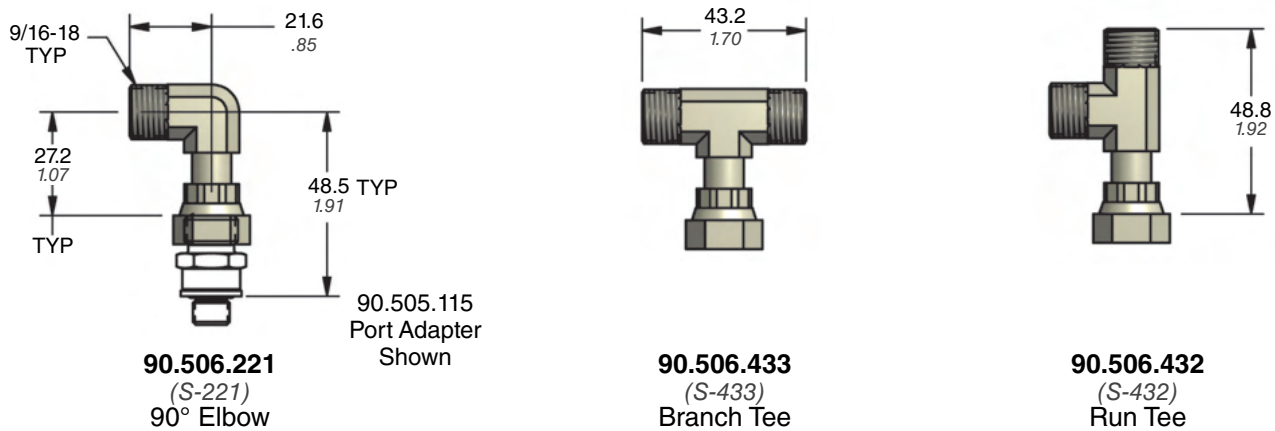
90.506.439
(S-439)
Branch Tee

Part No.	A
439 .SS	22 .87
449	36 1.42
459	43 1.69

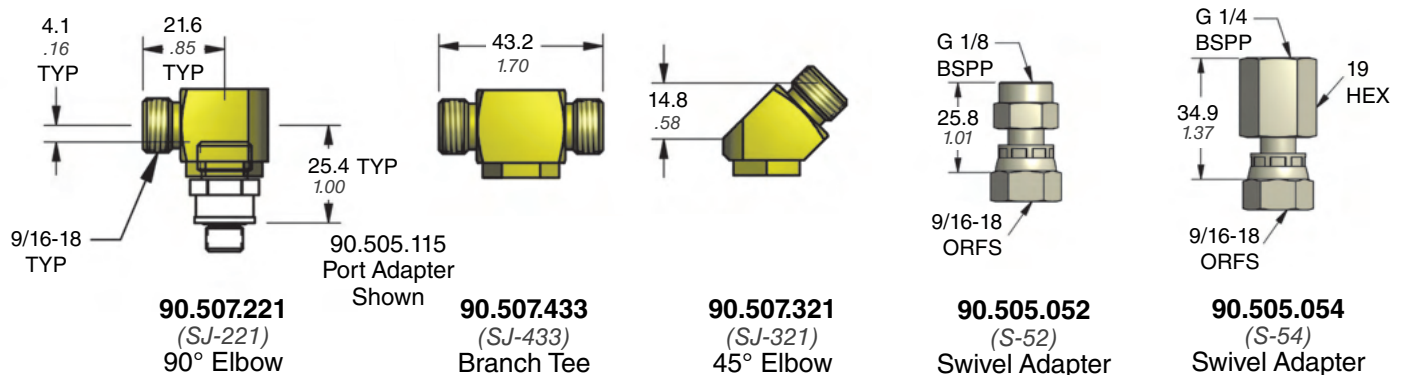
Fittings



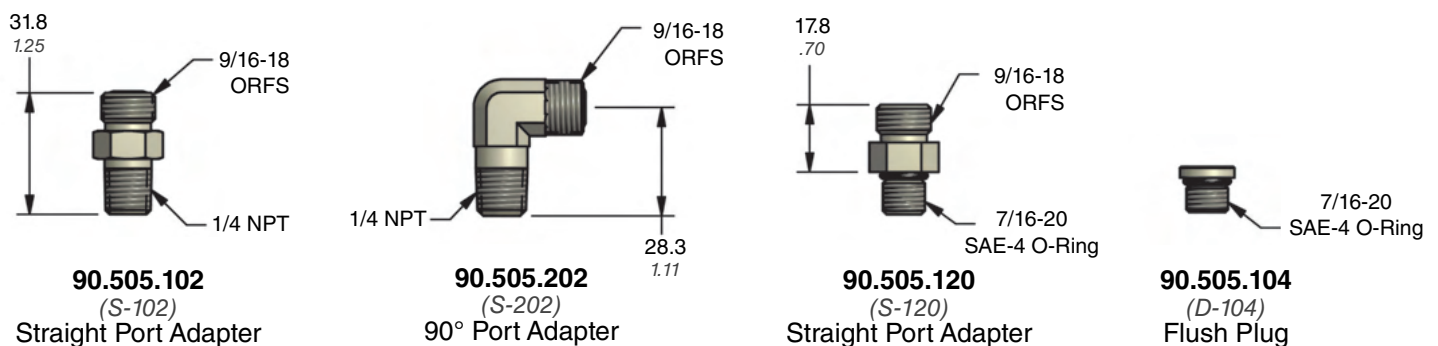
Standard Swivel Nut Fittings



Compact Swivel Nut Fittings

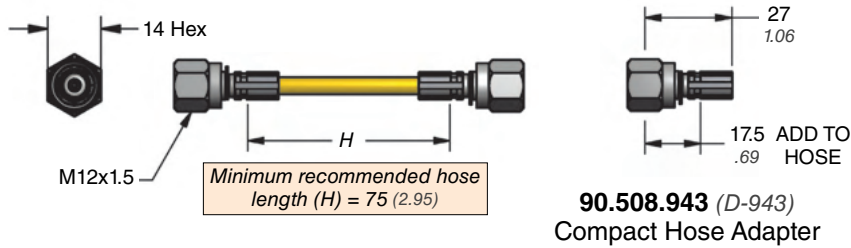


Retrofit Port Adapters

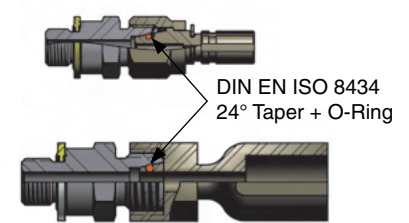


Components: D-24 Tapered Fittings

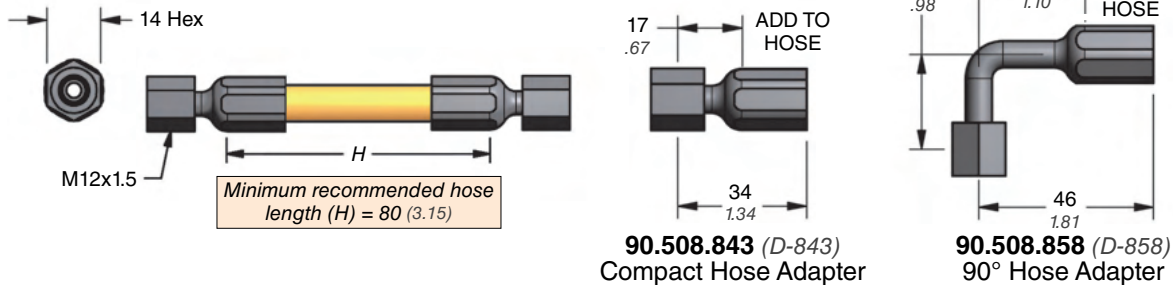
D-24 Hose System with 90.700 or 90.705 (Y-700 or Y-705)



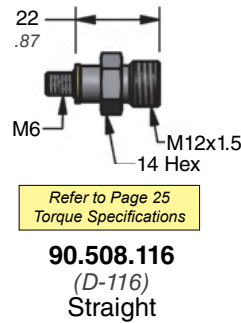
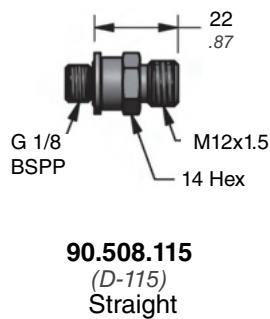
DADCO's D-24 Fittings have a 24° taper and o-ring.



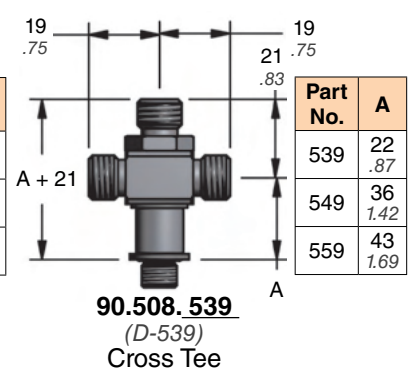
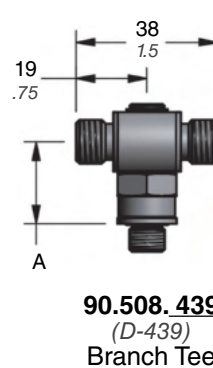
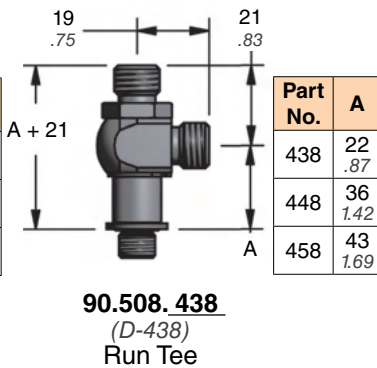
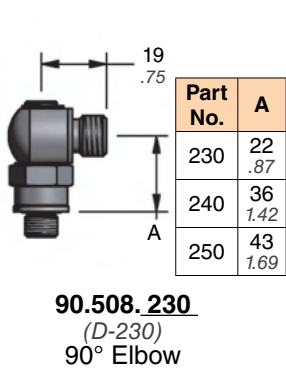
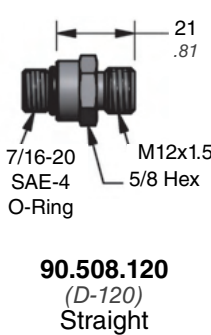
D-24 Hose System with 90.500 (Y-500)



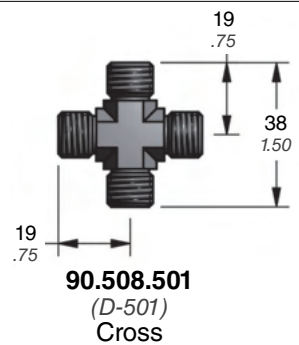
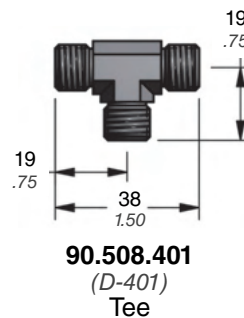
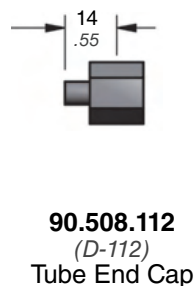
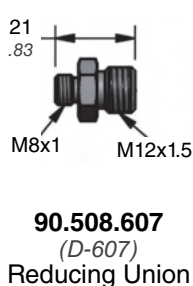
Port Adapters



Retrofit Only

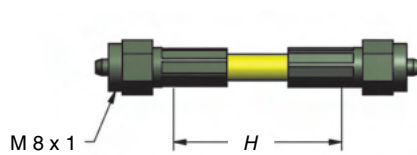


Fittings

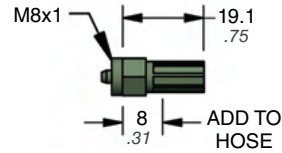


MINIFLEX® Hose System with 90.700 or 90.705 (Y-700 or Y-705)

.SS = Stainless Steel Option Available



Minimum recommended
Hose Length (H) = 45 (1.77)

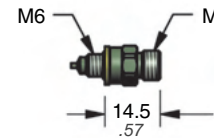


90.601.943 **.SS**
(L-943)

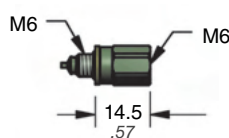
Permanent Hose Adapter

MINILink® Fittings

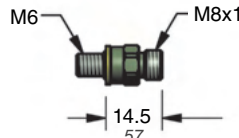
Micro Series (C.045 – C.250) and Ultra Force® Series (U.0175/U.0325) Port Adapters



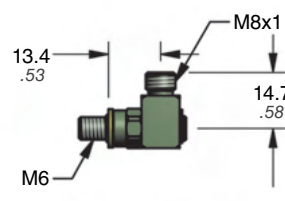
90.607.122
(L-122)
Micro Service Fitting



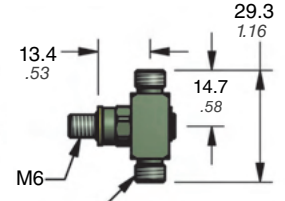
90.607.038
(L-38)
Micro Port Adapter
Extension



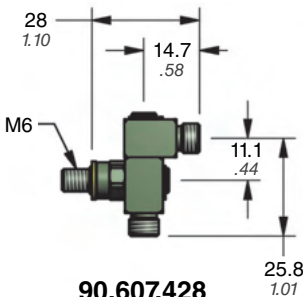
90.607.120 **.SS**
(L-120)
Straight Port
Adapter



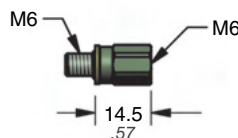
90.607.220 **.SS**
(L-220)
90° Port Adapter



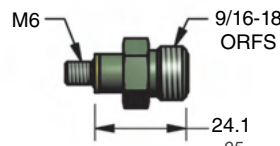
90.607.429 **.SS**
(L-429)
Branch Tee Port
Adapter



90.607.428
(L-428)
Run Tee Port
Adapter

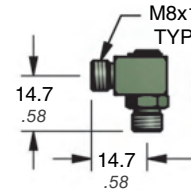


90.607.035
(L-35)
Port Adapter
Extension

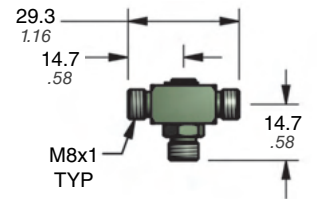


Refer to Page 25
Torque Specifications

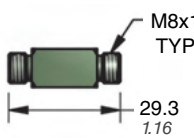
90.505.116
(S-116)
Reducer
M6 → 9/16-18



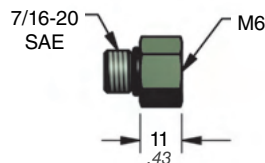
90.607.201
(L-201)
Elbow



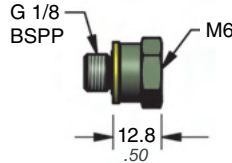
90.607.401
(L-401)
Union Tee



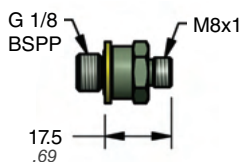
90.606.303
(L-303)
Union



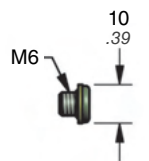
90.607.055
(L-55)
Reducer
7/16-20 → M6



90.607.065
(L-65)
Reducer
G 1/8 → M6



90.607.115
(L-115)
Reducer
G 1/8 → M8x1

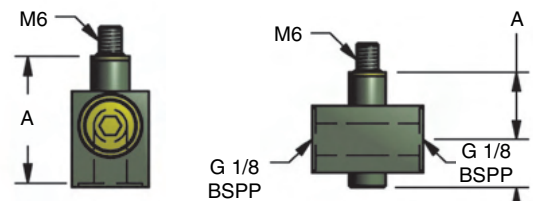


90.607.110
(L-110)
Port Plug



90.605.109
(L-109)
Fitting Plug

M6 → G 1/8 Port Adapters



90.607.116
Straight

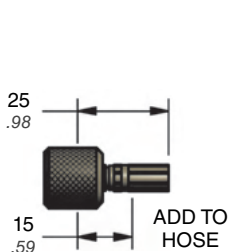
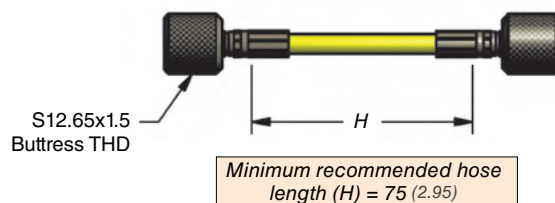
90.607.439
Branch Tee

Part No.	A
116	33 1.30
126	46 1.81

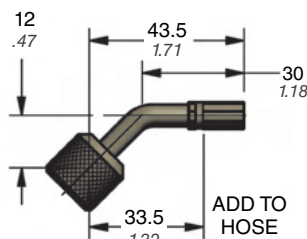
Part No.	A
439	18 .71
449	31 1.22

Components: Zip (CNOMO) Fittings

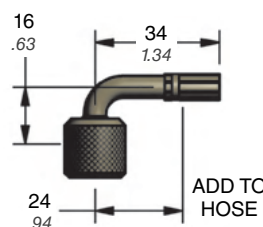
Zip Hose System with 90.700 or 90.705 (Y-700 or Y-705)



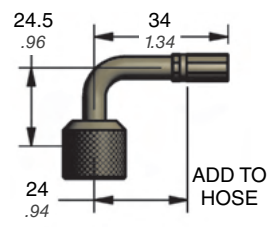
90.804.943
(B-943)
Straight Hose Adapter



90.804.954
(B-954)
45° Hose Adapter

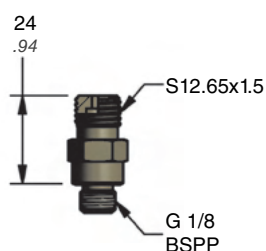


90.804.958
(B-958)
90° Short Neck
Hose Adapter

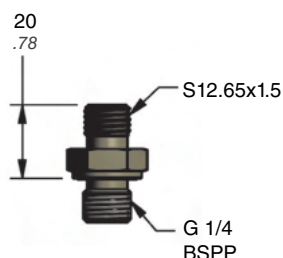


90.804.959
(B-959)
90° Long Neck
Hose Adapter

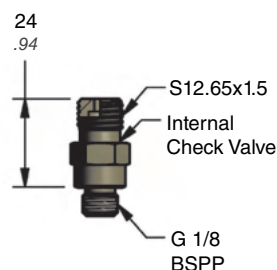
Fittings



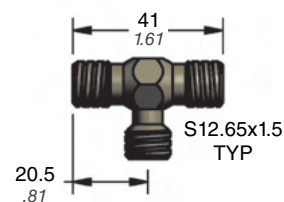
90.805.115
Straight Port Adapter



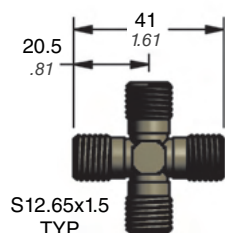
90.805.122
Straight Port Adapter



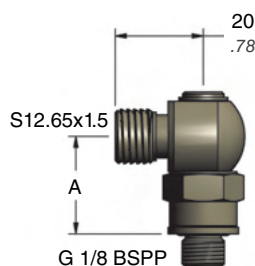
90.805.190
Port Adapter with Valve



90.806.401
Tee

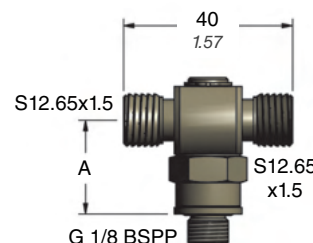


90.806.501
Cross



90.807.230
90° Port Adapter

Part No.	A
230	22 .87
240	36 1.42
250	43 1.69

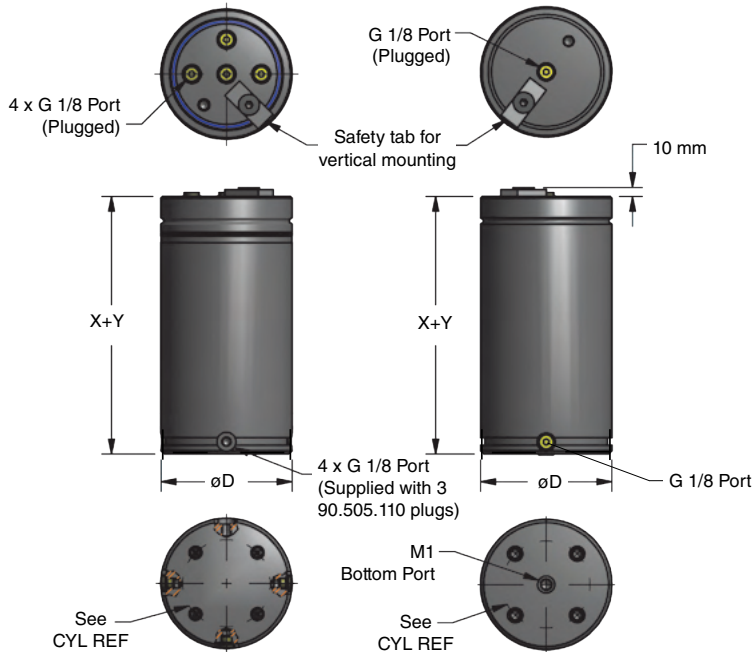


90.807.439
Branch Tee Port Adapter

Part No.	A
439	22 .87
449	36 1.42
459	43 1.69

Surge Tanks

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.



F – Free Flow Model

M1 – SMS-i® Model

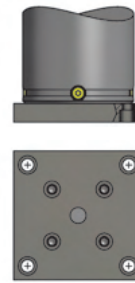
ST	30	50	75	100
D	95 3.74	120 4.72	150 5.91	195 7.67
X	117 4.61	137 5.39	152 5.98	157 6.18
Y	Volume of Tank L (in³)			
50	0.59 1.97	1.05 36	1.71 105	2.92 178
100	0.85 3.94	1.44 52	2.33 142	3.99 244
150	1.10 5.91	1.83 67	2.94 180	5.06 309
200	1.35 7.87	2.22 82	3.56 217	6.13 374
250	1.60 9.84	2.62 98	4.17 254	7.20 439
300	1.85 11.81	3.01 113	4.78 292	8.27 505
350	2.10 13.78	3.40 128	5.40 329	9.34 570
400	2.35 15.74	3.79 144	6.01 367	10.41 635

ST.50.150.B29



B11

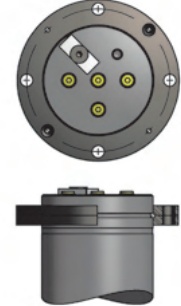
90.11.
CYL REF



NOTE: B11 mount available with ST.30-ST.75 models only

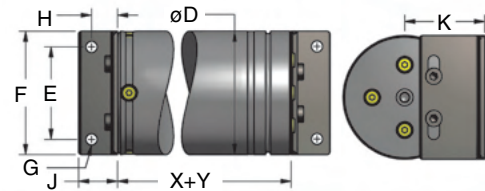
B21

90.21.
CYL REF



B29

90.29.
CYL REF



Surge Tank	CYL REF	D	E	F	G	H	J	K
30	3000	95 3.74	50 1.97	75 2.95	4 x M10 3/8	25.4 1.00	38 1.50	50.5 1.99
50	5000	120 4.72	90 3.54	120 4.72	4 x M10 3/8	25.4 1.00	38 1.50	78 3.07
75	7500	150 5.91	90 3.54	120 4.72	4 x M10 3/8	25.4 1.00	38 1.50	85 3.35
100	10000	195 7.67	100 3.94	150 5.91	4 x M12 1/2	31.8 1.25	50.8 2.00	98.5 3.88

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

Ordering Example:

ST.30. 150. TO. F

Size:

30, 50, 75, 100

Length (Y):

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

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.

Surge Tank Recommendations

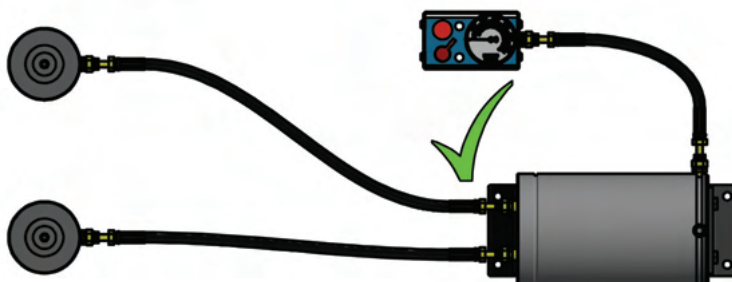
When piping to a Surge Tank, it is important to have a direct route from the gas spring port to a dedicated port on the Surge Tank. DADCO recommends using the Y-400 hose to maximize flow between gas spring and Surge Tank. When selecting fittings, it's important to select fittings with the least amount of flow restriction. Follow the guidelines below to avoid an increase in the system's operating temperature and pressure rise. For any questions, contact DADCO.

Surge Tank Hose Selection

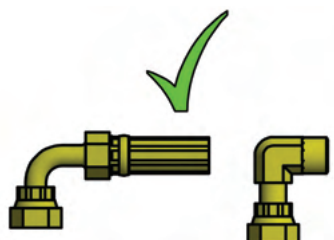
Hose Type	Inner Diameter mm inch	Working Pressure bar psi
90.400 (Y-400)	6.5 .25	345 5000



Piping Recommendations



Fitting Recommendations



90.504.758
90.504.759
90.504.459



90.507.221

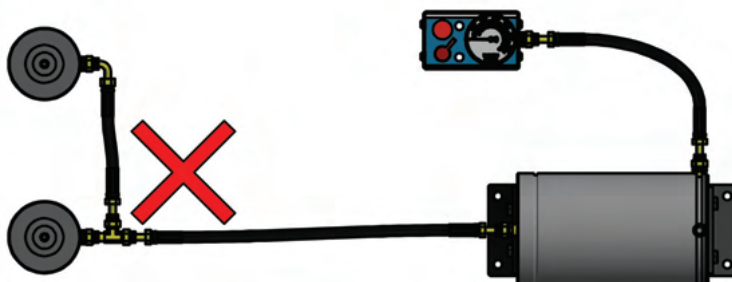
90.506.221



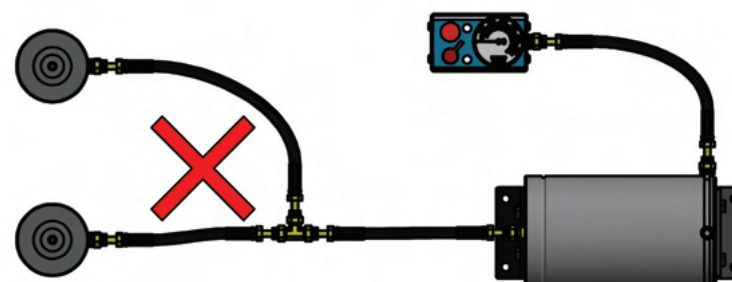
90.507.321



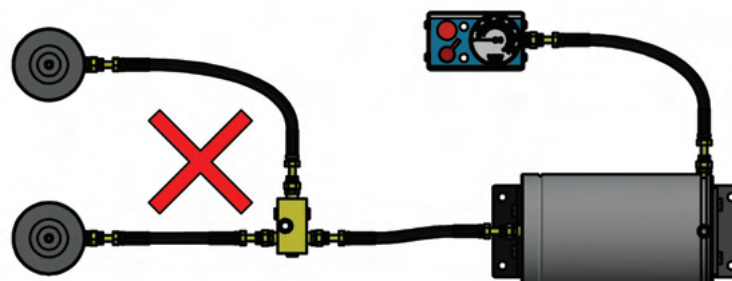
90.506.230



Do not split routes using tees.



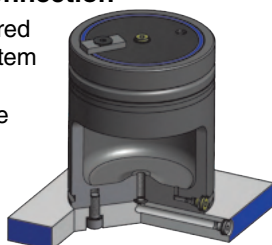
Do not split routes using tees.



Do not split routes using distribution blocks.

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.



Operating Specifications

Charging Medium: Nitrogen Gas
Charging Pressure Range: 15 – 150 bar
(220 – 2175 psi)

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

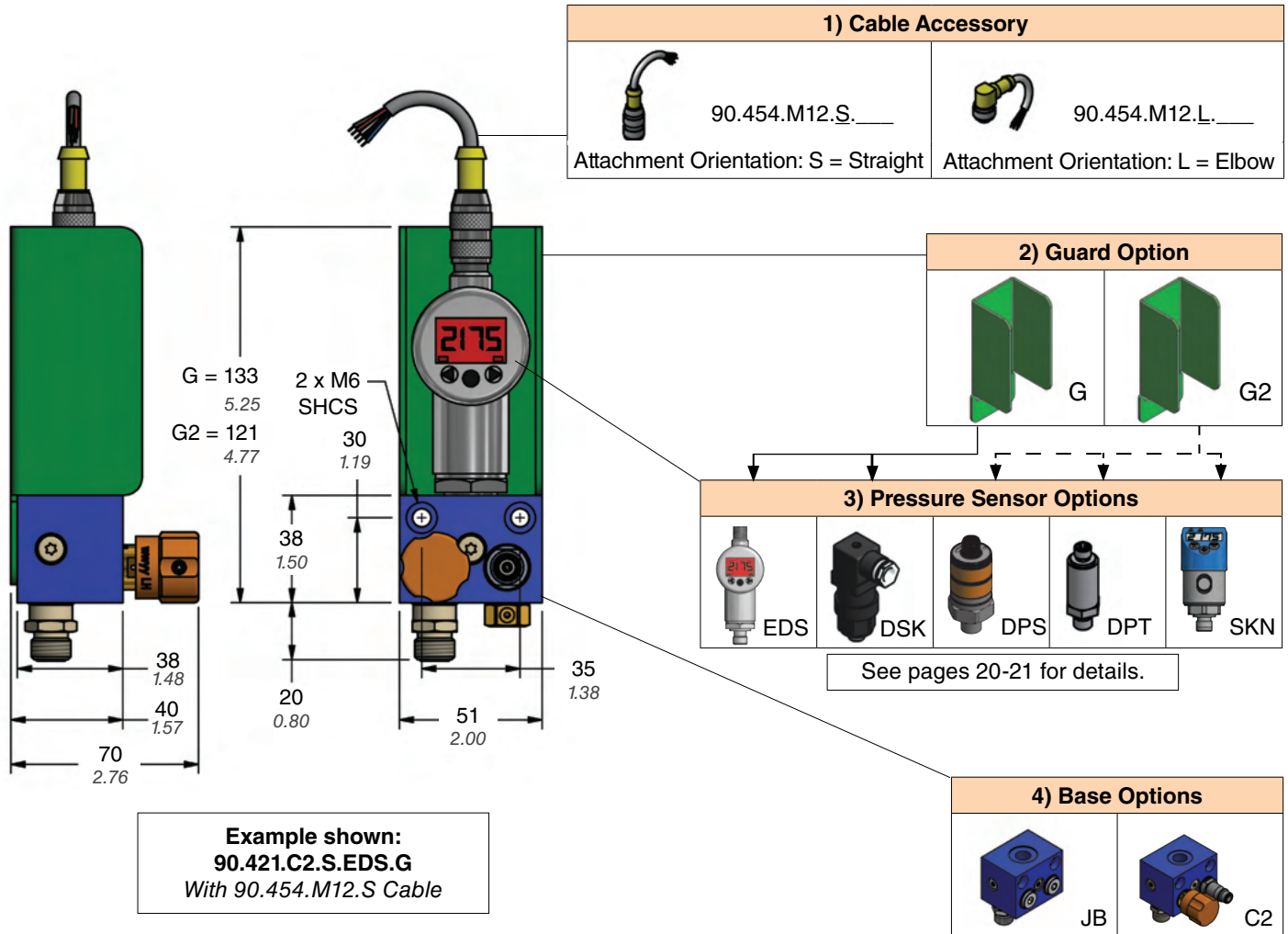
*Note: Surge Tank pressure should not exceed 264 bar (3828 psi) at maximum temperature.

Electronic Pressure Monitors

DADCO offers two types of Electronic Pressure Monitors to monitor nitrogen gas pressure during operation: An Electronic Pressure Monitor or a Control Panel with Pressure Monitor. For maximum versatility both types have multiple configurations to best suit your application. DADCO offers a variety of pressure sensor options to alert press controllers to changes in system pressure. Pressure 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.



GM specific option available, reference bulletin B16106. See page 22 for C2 details.

Ordering Example:

90.421. C2. S. EDS. G

Model Number

Base Option

JB = Block only (Bleed Valve, Filler Valve and Rupture Disk not included),

C2 = Block with Vibration Resistant Bleed Valve, Filler Valve and Rupture Disk

Guard Option

G, G2

Pressure Sensor Options

EDS = Electronic Pressure Switch, DSK = Piston Pressure Switch, DPS = Dial Pressure Switch, DPT = Electronic Pressure Transmitter, SKN = Electronic Pressure Switch

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.



Components: Pressure Monitors

Electronic Pressure Monitor Components

Follow this step by step guide and choose the components that are applicable for your application needs.








1) Cable Accessories

DADCO's Electric Pressure Monitors have two cable accessory options to choose from: the S, straight, or L, elbow. Review the details provided below to select the correct option for your application.

 <p>90.454.M12.S.____ Attachment Orientation: S = Straight</p>	 <p>90.454.M12.L.____ Attachment Orientation: L = Elbow</p>
Cable Length: 02 = 2 m, 05 = 5 m, 10 = 10 m	
Applicable for EDS, DPS, DPT & SKN sensor options	

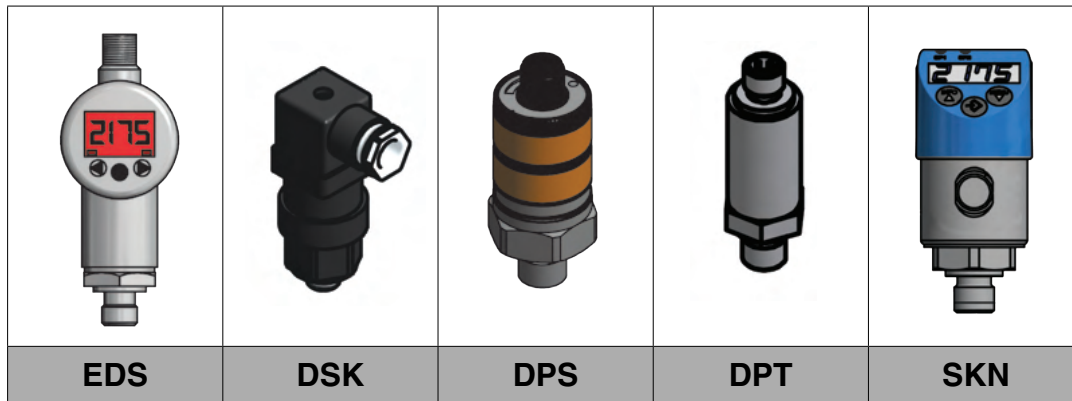
2) Guard Options

DADCO's Electric Pressure Monitors have two guard options available: G and G2. The G option is recommended to be used with our EDS and DSK Pressure Sensor Options. The G2 option is recommended to be used with our DPS, DPT and new SKN Pressure Sensor Options. Review the details provided below to select the correct option for your application.

<p>G</p> 	<p>G2</p> 
Guard Length: 95 mm	Guard Length: 83.1 mm
Width: 51 mm	Width: 51 mm
<p>Recommended Electronic Pressure Sensors:</p> <div data-bbox="321 1724 391 1902">  <p>EDS</p> </div> <div data-bbox="548 1745 646 1902">  <p>DSK</p> </div>	<p>Recommended Electronic Pressure Sensors:</p> <div data-bbox="971 1730 1045 1902">  <p>DPS</p> </div> <div data-bbox="1130 1730 1187 1902">  <p>DPT</p> </div> <div data-bbox="1268 1724 1349 1902">  <p>SKN</p> </div>

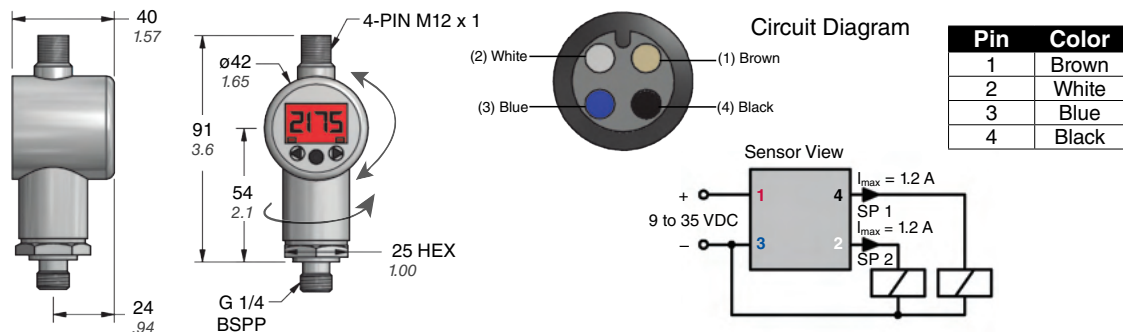
3) Pressure Sensor Options

DADCO's Electric Pressure Monitors have five sensor options available: EDS, DSK, DPS, DPT and SKN. Review the details provided below to select the correct option for your application.



EDS – Electronic Pressure Switch

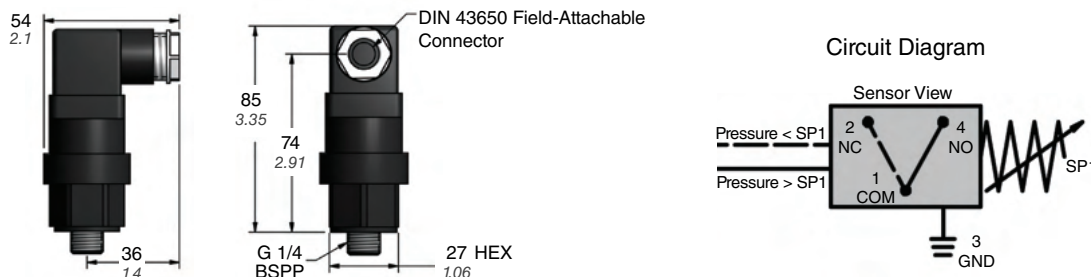
The EDS switch features an LED digital display that reads pressure value in bar, psi or MPa. The EDS models display face rotates 270° while the body rotates 340° for added versatility, the sensor also features two switching outputs that can be easily set with face mounted push buttons. *Note: EDS uses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



- | | | | | |
|------------------|--------------------|----------------------------|--------------------------|------------------|
| Features: | • Measuring Range: | 0 – 400 bar (0 – 5800 psi) | • Output: | (2) PNP Pin 2, 4 |
| | • Supply Voltage: | 9 – 35 VDC | • Electrical Connection: | 4 – Pole M12 x 1 |
| | • Switch Rating: | 1.2 A max | • Current Consumption: | 35 mA max |

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 manually adjusted 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 field-attachable connector.*

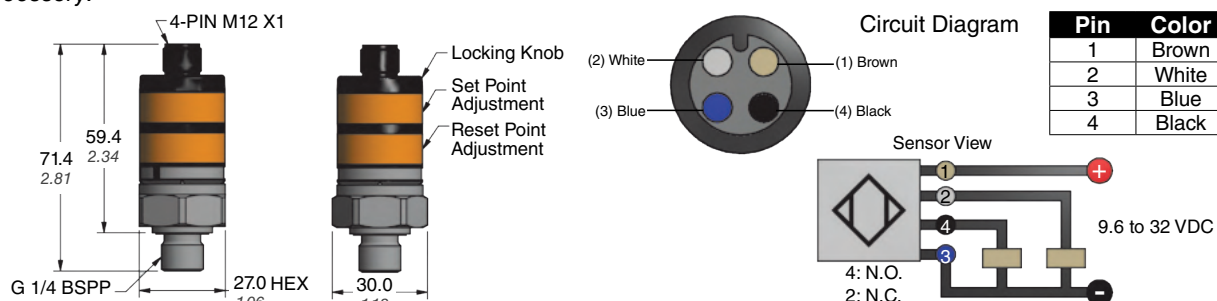


- | | | | | |
|------------------|--------------------------|--------------------|----------------------------|-----------------------------------|
| Features: | • Max Pressure Rating: | 600 bar (8700 psi) | • Range Tolerance: | ± 5 bar (± 72.5 psi) |
| | • Output: | SPDT Switch | • Switch Adjustment Range: | 50–200 bar (725–2900 psi) |
| | • Electrical Connection: | DIN 43650 | • Switch Rating: | 1 AMP at 250 VAC, 4 AMP at 24 VDC |

Components: Pressure Monitors

DPS – Dial Pressure Switch

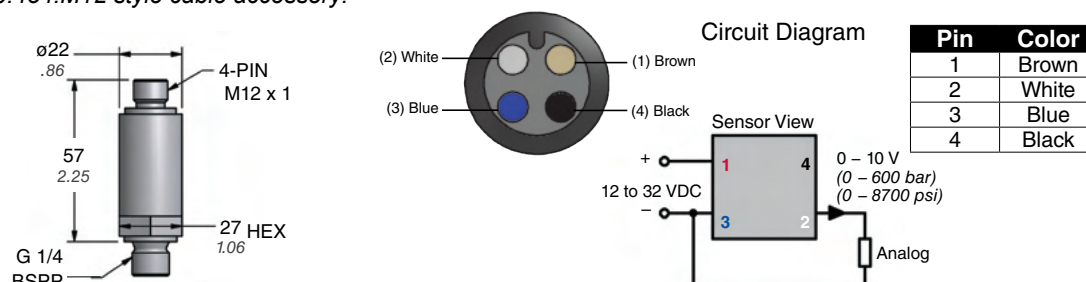
The DPS switch features two manually adjustable dials. The upper dial is the set pressure and the lower dial is the reset pressure. When the system pressure increases to the set value, Output 1 (pin 4) turns on, and Output 2 (pin 2) turns off. When the system pressure decreases to the Reset Pressure,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



- | | | | | |
|------------------|------------------------|----------------------------|--------------------------|-------------------------------------|
| Features: | • Measuring Range: | 0 – 400 bar (0 – 5800 psi) | • Electrical Connection: | 4 – Pole M12 x 1 |
| | • Operating Voltage: | 9.6 – 32 VDC | • Current Consumption: | < 25 mA |
| | • Setting Point Range: | 20–400 bar (290–5800 psi) | • Switch Output: | PnP (1 N.O. & 1 N.C. Complementary) |
| | • Reset Point Range: | 12–392 bar (175–5685 psi) | • Switch Point Accuracy: | < ± 2.5% |
| | • Switch Rating: | 500 mA | | |

DPT – Electronic Pressure Transducer

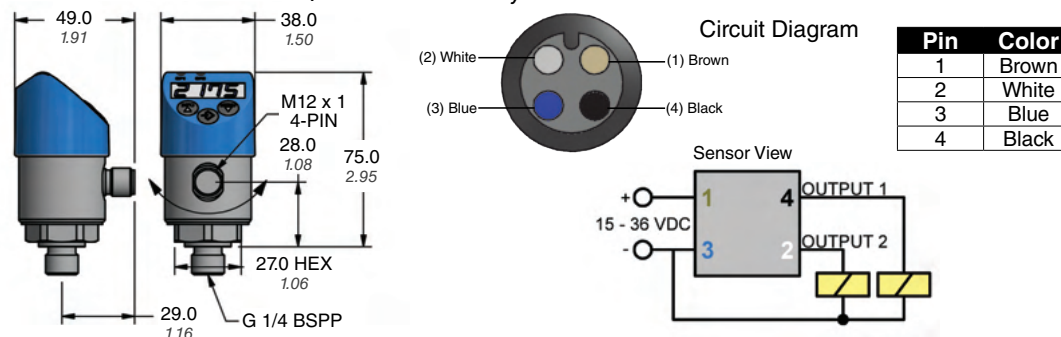
DADCO's DPT unit is a pressure transducer, producing an analog signal that provides a range of voltage. The DPT converts pressure input to a 0–10 V output, the voltage output can then be scaled by a press controller to read the pressure value. *Note: DPT uses 90.454.M12 style cable accessory.*



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

SKN / SKP – Electronic Pressure Switch

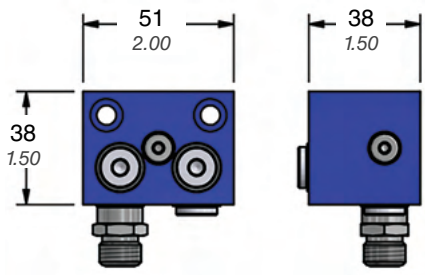
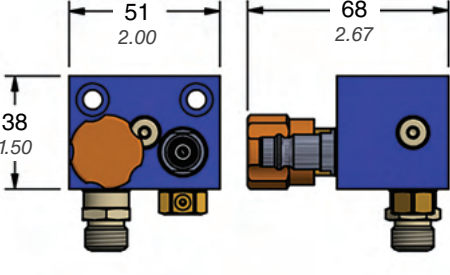
The SKN / SKP pressure switch features an LED digital display that reads pressure value in bar, psi or MPa. The SKN / SKP models blue LED display is highly visible and is easily configured to control press operations when set pressure limits are exceeded. *Note: SKN uses 90.454.M12 style cable accessory.*



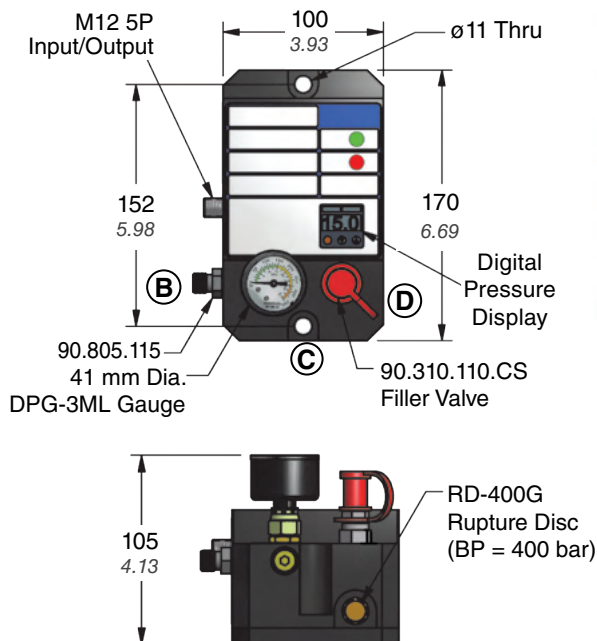
- | | | | | |
|------------------|--------------------|--|--------------------------|-------------------|
| Features: | • Measuring Range: | 0 – 400 bar (0 – 5800 psi) | • Accuracy: | ≤ ± 1% Full Scale |
| | • Voltage: | 9 – 35 VDC | • Electrical Connection: | 4 – Pin M12 x 1 |
| | • Output Signal: | SKN – (2) NPN Pin 2, 4
SKP – (2) PNP Pin 2, 4 | • Current Consumption: | 45 mA |

4) Base Options



DADCO's Electric Pressure Monitors have two base options to choose from: JB = block only and C2 = Block with Vibration Resistant Bleed Valve, Filler Valve and Rupture Disk. DADCO recommends using the C2 Base Option with the SKN Pressure Monitor Sensor Option. Review the details provided below to select the correct option for your application.

	
JB Block	C2 Block
Height: 38 mm	Height: 38 mm
Width: 51 mm	Width: 51 mm

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 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. Reference B10143B for additional information.

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	

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

Ordering Example:

90.406.421. B.

Plate Style

B = English plate style
A = Japanese plate style

Fitting Location

B, C, D, BD

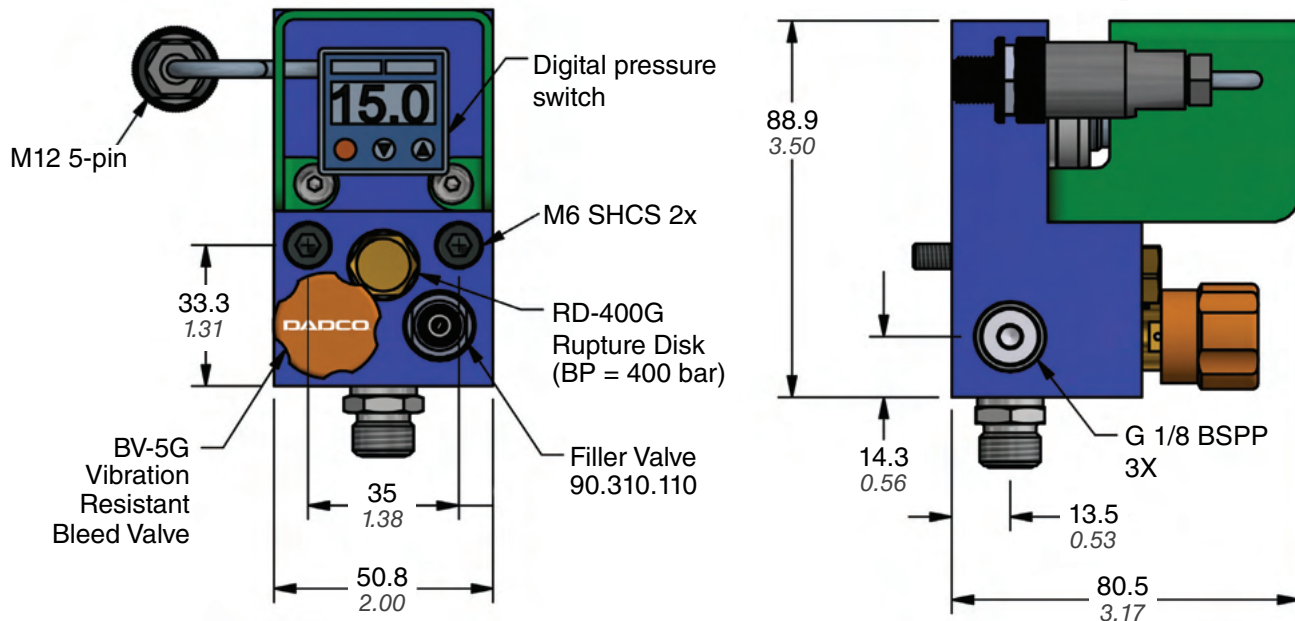
- **Output:** SPST N.O. (Normally Open)
- **Supply Voltage:** 12 – 24 VDC, 80 – 130 VAC (50 – 60 Hz)

- **Max Pressure Rating:** 350 bar (5076 psi)
- **Electrical Connection:** M12 (B – Code), 5 Wire, Reverse Key

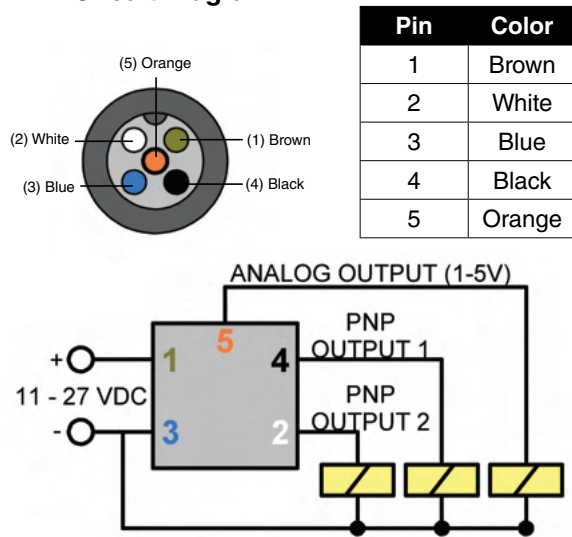
Compact Digital Pressure Sensor

Linked Systems

The new 90.422.D is our smallest digital pressure monitor. The 90.422.D offers an even more compact sensor option for challenging space constraints. The 90.422.D is available with a digital sensor display output in either Bar or MPa or with an analog gauge display. Fully integrated fill and bleed valves on the same face of the panel allow for easy access. DADCO's patent pending vibration resistant BV-5G comes standard on the 90.422.D, ensuring reliable performance in demanding press environments.



M12 Circuit Diagram



Performance Specifications:

ANALOG OUTPUT (1-5Vdc):

- Analog Scaling: User may configure analog output scaling to any range within Full Scale of sensor
- Accuracy: $\pm 1.0\%$ Full Scale (includes effects of linearity, hysteresis and repeatability)
- Full Scale: 0 – 35 MPa / 0 – 350 bar
- Output Resolution: 25 mV
- Response time: 50 m/sec

PRESSURE SWITCH OUTPUT:

- Type: PNP open collector up to 30 Vdc/ 80mA
- Switch Setting: User may adjust switch actuation & deadband to any points within Full Scale sensor range
- Setting Accuracy: $\pm 1.0\%$ Full Scale
- Response Time: 5 – 20 m/sec
- Number of Contacts: 2
- Hysteresis: Variable

Ordering Code:

Model Number
Pressure Monitor Sensor Options: D = Digital,
P = PSI Analog Gauge, A = Metric Analog Gauge.

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 (90.607.115).

90.422. D. S. G. M12

Electrical Connection:

M12 = 5 pin M12
PT = pigtail

Guard Option

Pressure Monitors

The 90.421.1 and 90.421.2D models visually alert the user to whether the pressure is at good standing or low pressure. The 90.421.2D model is capable of shutting the press down if it drops below the minimum operating pressure, with a dry-contact switch.

90.421.1 (1/2 NPS Thread) 90.421.2D.M12 (M12 Thread) 90.421.2D.BH1 (7/8-16 Thread) 90.421.2D.BH2 (7/8-16 Thread) 90.421.2D.BH3 (7/8-16 Thread)



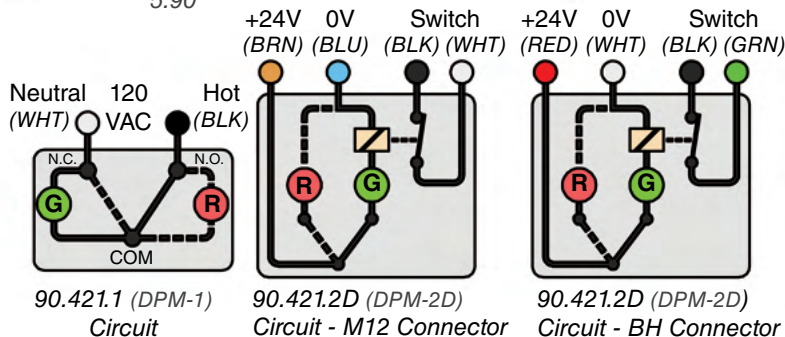
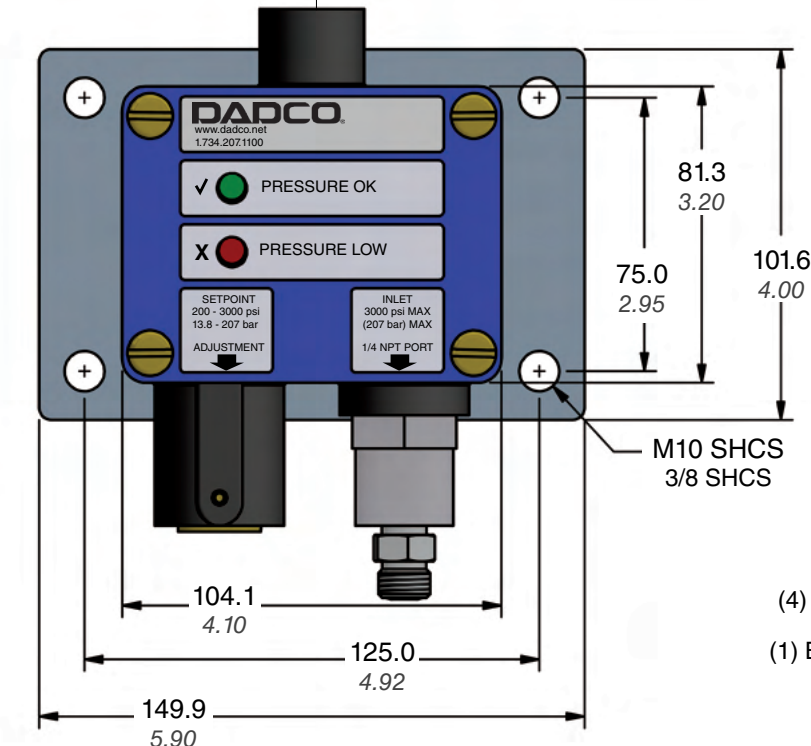
Model No.	Supply Voltage	Switch Rating	Pressure Range
90.421.1 (DPM-1)	120 VAC	—	15 – 200 bar 220 – 3000 psi
90.421.2D (DPM-2D)	24 VDC	0.4 A	15 – 200 bar 220 – 3000 psi

M12 Connector

Cable Part Number	Length
90.454.M12.S.02	2m Straight
90.454.M12.S.05	5m Straight
90.454.M12.S.10	10m Straight
90.454.M12.L.02	2m 90°
90.454.M12.L.05	5m 90°
90.454.M.12.L.10	10m 90°

BH Connector

Cable Part Number	Length
AZ54MC4PM02	6ft Straight
AZ54MC4PM03	12ft Straight



90.421.1 (DPM-1)

When pressure is OK, **green** lights up.
When pressure is LOW, **red** lights up.

90.421.2D (DPM-2D)

When pressure is OK, **green** lights up, switch is CLOSED
When pressure is LOW, **red** lights up, switch is OPEN

----- : Pressure < Set Point
——— : Pressure > Set Point

Ordering Example:

90.421.2D. *BH1. BP. 102

Model Number

90.421.1 or 90.421.2D
(90.421.2D replaces former 90.421.2)

Connector

BH1 – Right (→), BH2 – Left (←)
BH3 – Straight Connector,
M12: 4-Pin M12-A Straight

(*Connector options are for 90.421.2D Model only.)

Fitting

90.505.102–Straight
90.505.202–90°

Backing Plate
(optional)

Product changes may occur during the life of this catalog without prior notice, but products supplied will remain functionally interchangeable.

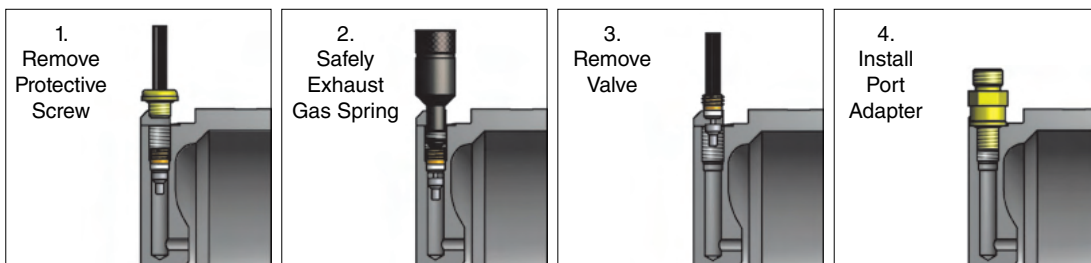
Piping Specifications

Converting from Self-Contained to Linked Mode

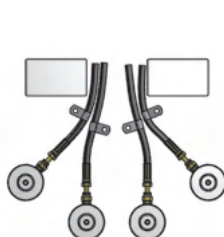
The following basic steps show how to easily convert DADCO gas springs from self-contained to linked mode. For more detailed instructions, refer to the relevant product catalog. (*Mini series gas spring with M6 port shown below.*)

CAUTION

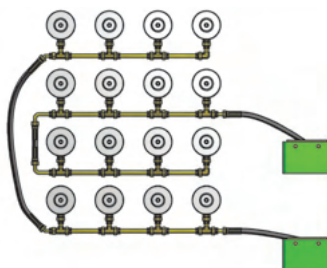
Always wear safety goggles when performing maintenance on nitrogen gas springs.



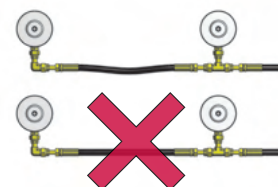
Recommendations for Linked Systems



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.

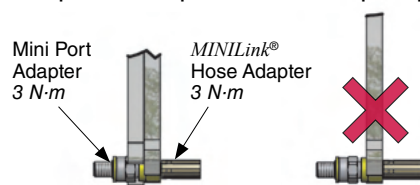
Torque Specifications

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

Type	Thread	lb-in	lb-ft	N-m
M6 Port Adapter	M6 x 1	25	2.1	3
MINILink® Hose Adapter	M8 x 1	25	2.1	3
G 1/8 Port Adapter	BSPP	168	14	19
ORFS Hose Adapter	9/16-18	204	17	23
D-24 Hose Adapter	M12 x 1.5	Hand-tight then ¼ turn with wrench		
Zip Hose Adapter	S12.65 x 1.5	Hand-tight		

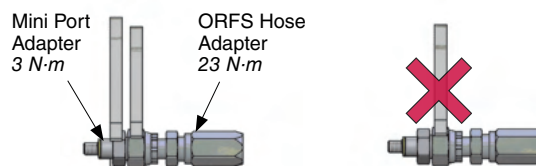
NOTE: It is important to adhere to these guidelines for the following fittings: 90.505.116 and 90.508.116.

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.



Mini Port Adapter + MINILink® Hose Adapter

Mini fittings and hose adapters have low torque values. Refer to the chart above to avoid possible damage from over-tightening.



Mini Port Adapter + 9/16-18 ORFS Hose Adapter

The torque requirement for the Mini Port Adapter is smaller than the ORFS Hose Adapter. Refer to the chart above. Do not torque port fitting with larger hose adapter nut.

Tools for Hose Assembly Construction

DADCO carries a variety of tools for Hose Assembly Construction, please refer to bulletin B11110B 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.



Mini Hose Cutter
90.320.7

Hose Assembly Clamp

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.



Mini Hose Assembly Clamp
90.320.9



Hose Assembly Clamp
90.320.6 (HAC)

Portable Crimping Unit

90.720

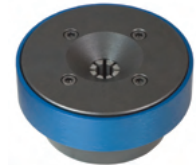
Used with appropriate die ring to create permanent hose assemblies. For more information, request bulletin B04112B.



Mini-Crimp

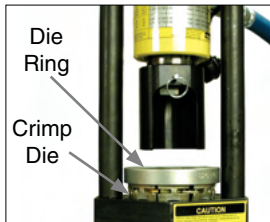
90.710.8

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



Crimp Dies

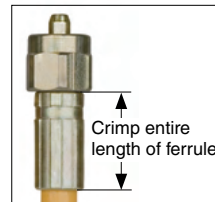
Used in Portable Crimping Unit to construct hose assemblies. For information on constructing hose assemblies, refer to bulletin B00120D.



Part No.	Crimp Die	Crimp Diameter mm / inch
90.700 / 90.705 (Y-700 / Y-705)	Mini-Crimp 90.710.8 No Ring Required	7.00 – 7.25 .276 – .285
90.500 (Y-500)	80C-P03 Gray Die 82C-R01 Ring	12.19 – 12.70 .480 – .500
90.400 (Y-400)	80C-P04 Red Die 82C-R01 Ring	14.22 – 14.73 .560 – .580

Using DADCO's Mini-Crimp

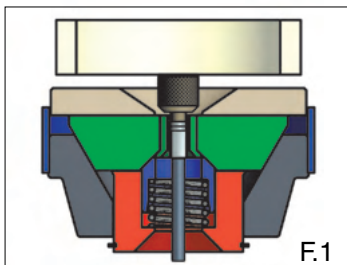
1. Place the Mini-Crimp 90.710.8 into the crimping machine. No die ring is required.
2. Insert the hose assembly from below through the center of the Mini-Crimp (F.1). For instructions on constructing a Mini Hose Assembly request bulletin B11110B.
3. Activate the hydraulic or pneumatic crimping machine to permanently crimp fitting to the hose (F.1).



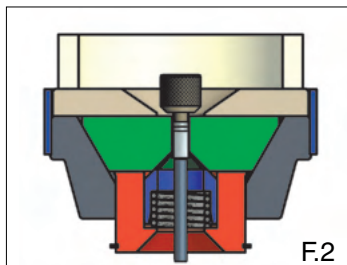
4. As the DADCO Mini-Crimp begins to close, position the fitting to ensure the entire length of the ferrule is crimped (F.2).

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

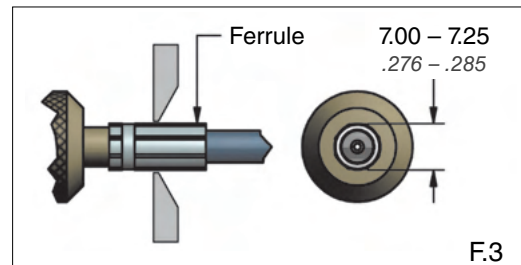
6. Measure the crimped ferrule diameter across the flats to verify it is within the crimp dimension range (F.3).



F.1



F.2



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 B16118B.



Quick Disconnect Filling Assembly with Gauge, 90.310.339, is also available.

90.310.040

Standard Pressure Regulator
90.310.201

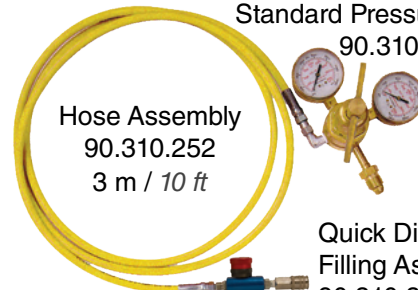


Hose Assembly
90.310.252
3 m / 10 ft

Quick Disconnect
Filling Assembly
90.310.338

90.310.044 (Self-Venting)

Standard Pressure Regulator
90.310.205



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

Quick Disconnect Charging Nipple

90.310.143 (M6 Port)

90.310.111 (G 1/8 Port)



90.310.143

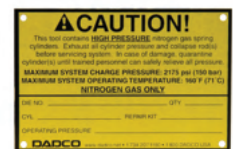


90.310.111

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 B01130E.



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

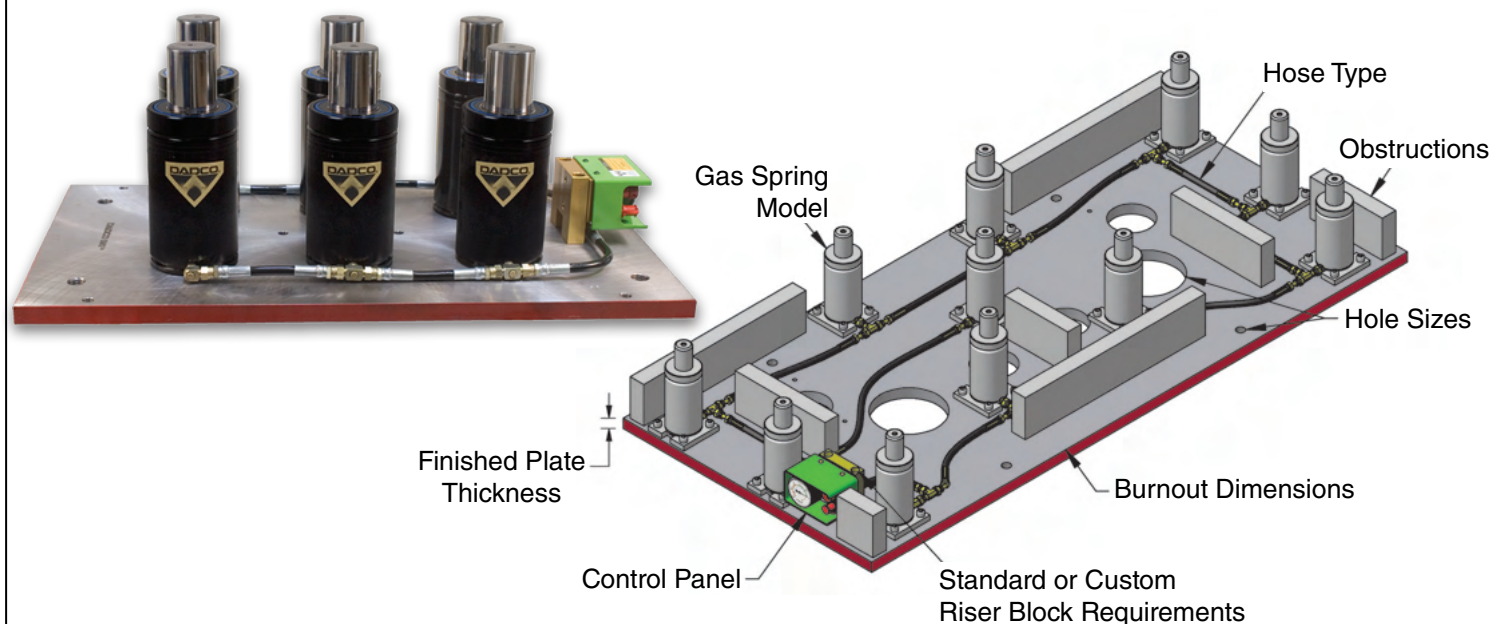
DADCO's Nitrogen Gas Booster System, DGB-150, is an all-in-one solution to the problems of low pressure supply tanks and lost nitrogen gas during discharge. For more information on the booster, refer to bulletin B07101.



Complete Linked System Solutions

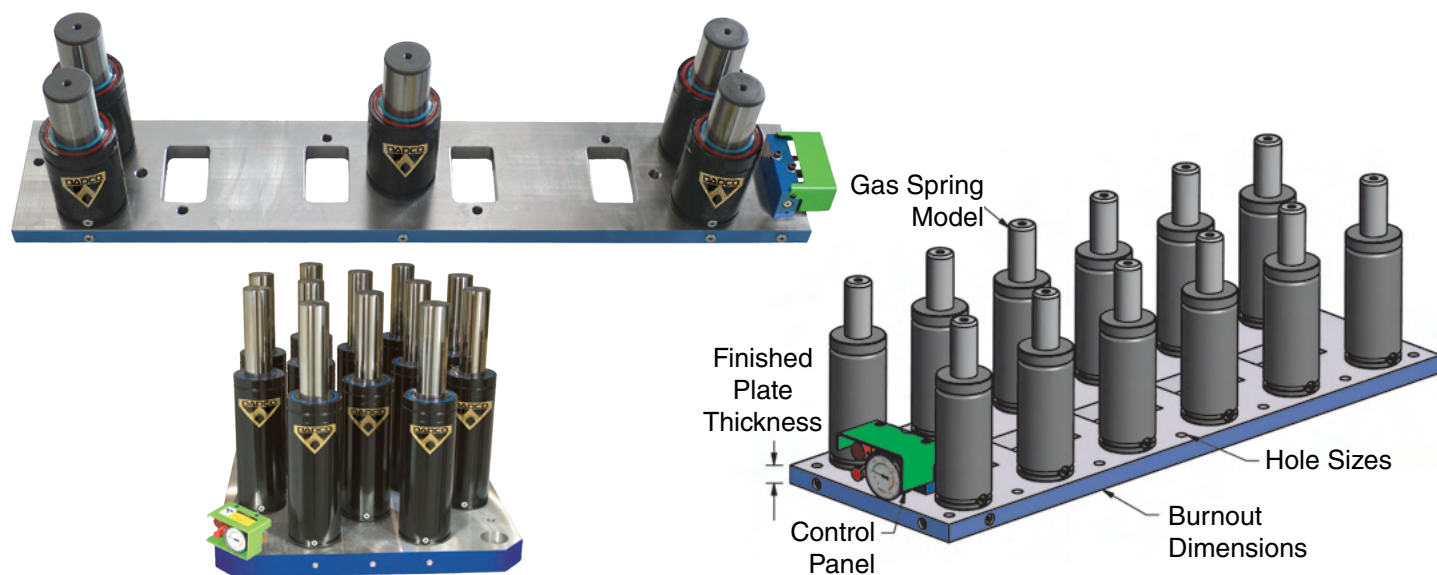
SMS®

For those instances where a customer prefers to have DADCO provide a ready-to-install finished system, DADCO offers several options. DADCO's Sectional Mounting System (SMS®) includes a custom plate manufactured to customer's specifications with a custom arrangement of DADCO nitrogen gas springs, control panel, hose and fittings. Systems are delivered completely assembled, tested and ready to install. For more information on DADCO's SMS® request catalog C13106D.



SMS-i®

DADCO's Sectional Mounting System – Internal (SMS-i®) is a potentially space saving custom system with internal piping allowing for tight configurations of DADCO nitrogen gas springs. The internal piping design eliminates the external hose and fittings allowing for a robust alternative to traditional manifold systems. For more information on DADCO's SMS-i® request catalog C13106D.



DADCO®

The global leader in nitrogen gas spring technology

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