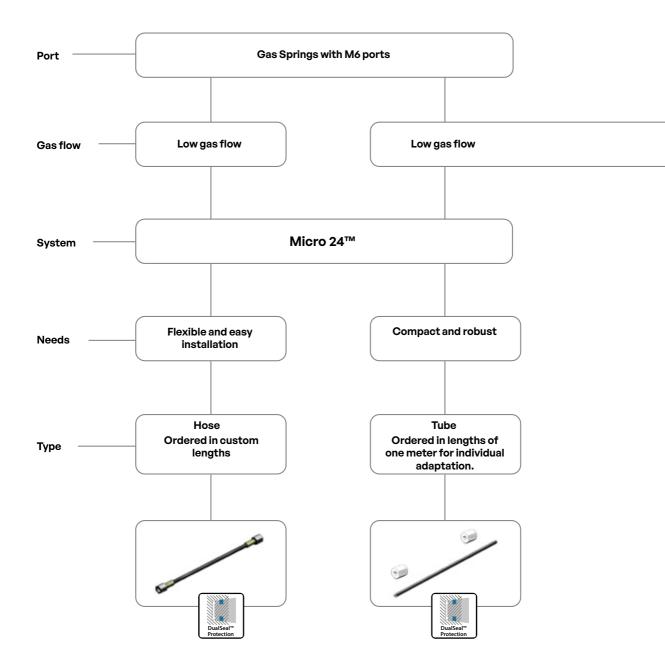
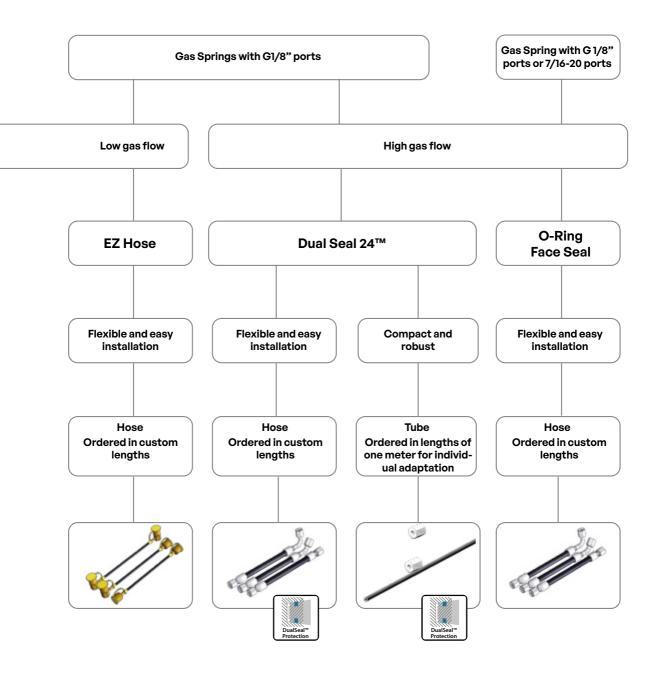
Linking System Selection





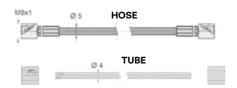
Linking System Selection



Introduction

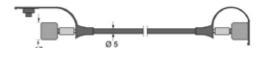
Connecting nitrogen Gas Springs via hose or tube offers the distinct advantage of being able to monitor and adjust pressure as well as charge and discharge the springs from outside the die. Hyson features five separate systems for connecting Gas Springs including DualSeal 24TM, Micro24TM, O-Ring Face Seal and EZ Hose (CNOMO).

Micro24™/ Compact Hose & Tube System



- Featuring a dual seal design which utilizes both metal to metal & o-ring sealing, this is ideal for high vibration applications.
- Offers hard tubing options as short as 75 mm as well as the smallest hose bend radius of 20 mm which allows springs to be connected with minimum center to center distances.
- 2 mm hose and tube ID limits the speed of charge and drain times.
- Compatible for hosing springs with G 1/8, 7 /16-20 & M6 ports.

EZ/CNOMO Hand Connection Hose System



- · Offers hand tightened connections which facilitates easy.
- · Connection of the Hose System with no tool required.
- 2 mm hose ID limits the speed of charge and drain times.
- The 5 mm OD hose offers a minimum bend radius of 20 mm and minimum hose length of 75 mm.
- Compatible for hosing springs with G 1/8, 7 /16-20 and M6 ports.

DualSeal 24™ Hose System/The Preferred Hose System



- Incorporates a dual seal design which utilizes both metal to metal and o-ring sealing, this is ideal for high vibration applications.
- Featuring 5 mm hose ID offering a high flow rate between springs and external tanks as well as quick charge and drain times.
- The 11 mm OD hose offers a minimum bend radius of 40 mm and minimum hose length of 120 mm.
- Compatible for hosing springs with G 1/8, 7 /16-20 & M6 ports
- Double leak-proof joints and rotational protection.

O-Ring Face Seal



- Used for high vibration applications.
- Featuring 6.25 mm hose ID offering the highest flow rate between springs & external tanks as well as the fastest charge and drain times.
- The large diameter 13 mm OD hose requires additional accommodation to account for a minimum bend radius of 51 mm and minimum hose length of 152 mm.
- Compatible for hosing springs with G 1/8 or 7 /16-20 ports only.
- This system is recommended when high gas flow is required, such as with the CS2 Series of controllable Gas Springs or external gas tanks.



E024 Safety Guidelines

For optimum performance life:



🛕 Before connecting Gas Springs to a hosed system, discharge the nitrogen gas and remove the inlet valve from each spring.



Position the control valve in the tool where it will be protected from mechanical damage, and on a higher level than the Gas Springs to minimize loss of lubrication oil when discharging



⚠ Use only nitrogen {N,} gas. The use of other types of gas can result in personal injury or failure of the Gas Spring/control panel.



🗥 Never exceed the maximum charging pressure marked on the Gas Spring. For most standard Gas Springs, the maximum charging pressure is 150 bar/2175 psi.



All valves on the control panel should be closed during operation.



We do not recommend hosing Gas Springs mounted using FC or FCS Flanges as there is a risk that the Gas Spring will rotate while in operation.

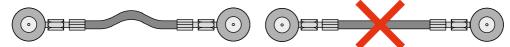


🛕 Gas Springs should be connected in a closed loop to help prevent the pad from tilting during

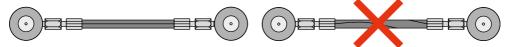
Installation Guidelines

Marning: Never exceed the maximum values given for pressure and temperature for the hoses. Make sure that hoses and adapters are clean before assembling.

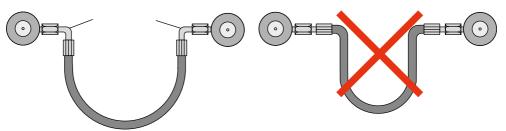
Correct Incorrect



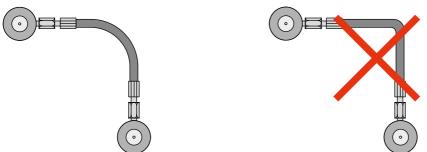
Choose a hose length that allows for a certain amount of play.



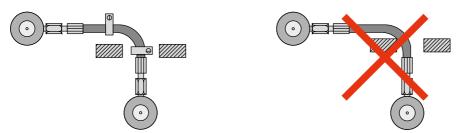
After assembly, the longitudinal marking on the hose must not be twisted.



Choose hose adapters that avoid sharp bends in the hose.



Never go below the recommended minimum bend radius of the hose.



Position the hose to avoid mechanical damage.

Micro 24™



Hose System

The Micro24[™] hose features a Dual Seal System to ensure double leak-proof joints as well as rotational protection. It shares the same fittings and adapters with the Micro24[™] tube for a wide range of application options. In addition, G 1/8 and G 1/4 ports can be connected to the Micro24[™] using an appropriate adapter. A wide range of standard lengths is available with custom lengths 100 mm up.

OD	5 mm
ID	Ø2 mm
Max. Working Pressure	475 bar/6888 psi
Min. Burst Pressure	1900 bar/27550 psi
Min. Bend Radius	
Min. Crimped Hose Length	100 mm* (total length assembled)

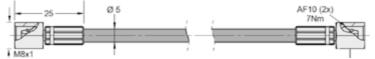
Hose Lengths						
Order Number	L (mm)					
4023500-0100	100					
4023500-0200	200					
4023500-0300	300					
4023500-0400	400					
4023500-0630	630					
4023500-0800	800					
4023500-1000	1000					
4023500-1500	1500					
4023500-2000	2000					
4023500-XXXX	XXXX*					

^{*} Customer specified lengths. Assembled hose length in millimeters. Minimum order length is 100 mm. Simply add the hose length onto the Order Number (i.e., 4023500-2500 for a hose assembly of 2500 mm length).

Micro 24[™] Hose and Hose End available separately.

Micro24™ Hose Only

Order Number 505081



Micro24[™] Hose End Order Number 505082

Micro24[™] Hose Clip Order Number 502646

Can be used to secure hoses using an MS screw.





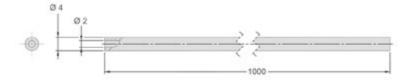
Tube System

The Micro24™ tube features soft sealed and self-crimping connections to ensure leak-proof tube joints. Easily cut into correct lengths, the tube can be bent into the desired shape using a tube bending tool or even by hand.

Protection

Tube (available in one meter lengths)

Order Number 504594-E

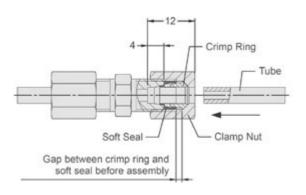


OD	4 mm
ID	2 mm
Max. Working Pressure	430 bar/6235 psi
Min. Burst Pressure	1100 bar/15950 psi
Min. Bend Radius	12 mm
Min. Tube Length	30 mm

Using the Micro24™ Tube

The cutting angle is 90° ±10. A hacksaw can be used to cut the tube. If a regular tube cutter or cutting pliers are used, the tube can become clogged limiting gas flow. Deburr the tube inside and out (max. 0.3X45° alt. R0.3) using the tube deburring tool. After cutting and deburring, clean the tube. Use compressed air to remove all loose particles.

Fit the clamp nut onto the adapter. Note: Do not tighten. Run the tube through the nut until it stops (~12 mm from the top surface of the nut). When tightening the nut, use a torque of 7 Nm. Tools to have available are a hacksaw, tube cutting fixture, tube bending tool, deburring tool, compressed air and torque wrench.

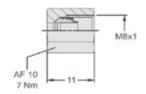




Tube Deburring Tool Order Number 505096



Tube Bending Tool (Bend Radius 20 mm) Part No. 504711



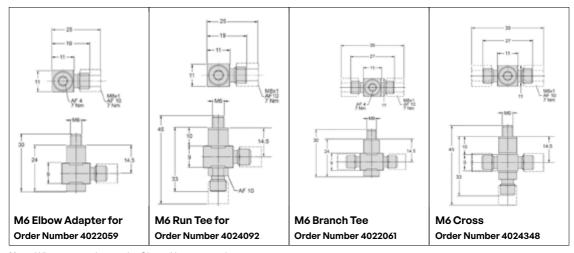
Clamp Nut Order Number 504589

All dimensions are in millimeters unless otherwise noted.

G

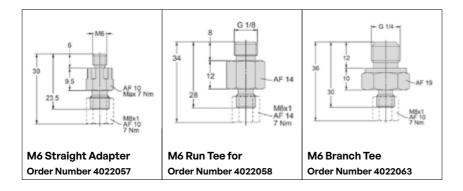
Adapters & Connectors

Charge Port Adapters

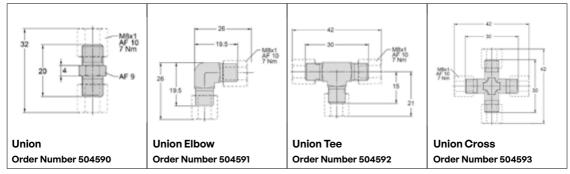


Note: When using tubes, order Clamp Nut separately.

Note: To use the M6 adapters with G 1/8 charge ports, use Order Number 503764. See page 264.



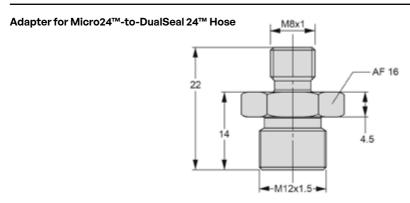
Hose-to-hose, Tube-to-Tube and Hose-to-Tube Connectors



Note: All dimensions are nominal. Data shown are typical. Actual date for any particular unit may vary.

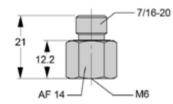
All dimensions are in millimeters unless otherwise noted.

Adapters for Connecting Springs with Control Panels and Distribution Blocks

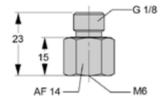


Order Number 4024351

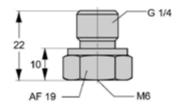
Adapters for 7/16-20, G 1/8 and G 1/4 Connection Ports



7/16-20 TO M6 Order Number 503814

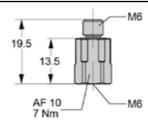


G 1/8 to M6 Order Number 503764



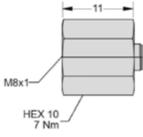
G 1/4 to M6 Order Number 503966

Adapter for Hose and Tube - M6 to M6



M6 to M6 Order Number 503762 Extension for Gas Springs using foot mounts.

End Cap for Micro24™

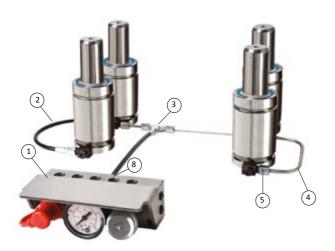


Order Number 4024353

All dimensions are in millimeters unless otherwise noted.



Installation Example



Ordering Information							
Position	Quantity	Part No.					
1	1	Micro24™ Control Panel	3123888				
2	2	Micro24™ Hose	4023500-XXXX				
3	1	Union Tee	504592				
4	1	Micro24™ Tube	504594				
5	6	Clamp Nut	504589				
6	2	M6Tee	4022061				
7	2	M6 Elbow 4022059					
8	1	M6 Straight Adapter	4022057				





Optional Accessories

Compatible with the Micro $24^{\rm TM}$ Hose System, the following accessories offer additional versatility and increase the customization of your force system:

- **Pressure Monitors** which indicate pressure in hosed systems. If the pressure rises or falls below a preset level, die operation is interrupted to reduce the probability of damage to a tool, machinery or scrap parts.
- **Distribution Blocks** which allow for individual Gas Springs to be connected to a common point.
- Modular Control Panels allow for control of individual Gas Springs or multiple systems.

EZ Hose



Hose System

A very compact and versatile O-ring sealed system that allows connections to be tightened by hand. In addition, G 1/8 and G 1/4 ports can be connected to the EZ-Hose System using an appropriate adapter. **Not for use with compression tanks.**

A wide range of standard lengths is available with custom lengths from 150mm up.

OD	5 mm
ID	Ø2 mm
Max. Working Pressure	500 bar/7250 psi
Min. Burst Pressure	2000 bar/29000 psi
Min. Bend Radius	
Min. Crimped Hose Length	I50 mm* (total length with sleeves)



EZ-Hose Clip Order Number 502646Secure hoses using an M5 screw.

Straight-Straight

Order Number 4014974-XXXX*

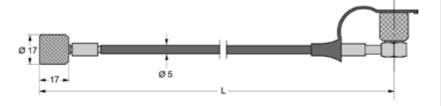


Straight to Straight						
Order Number	L (mm)					
4014974-0200	200					
4014974-0300	300					
4014974-0400	400					
4014974-0630	630					
4014974-0800	800					
4014974-1000	1000					
4014974-1500	1500					
4014974-2000	2000					
4014974-XXXX*	XXXX*					



Straight-90°

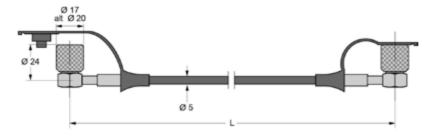
Order Number 4017568-XXXX*



Straight to 90°						
Order Number	L (mm)					
4014974-0200	200					
4014974-0300	300					
4014974-0400	400					
4014974-0630	630					
4014974-0800	800					
4014974-1000	1000					
4014974-1500	1500					
4014974-2000	2000					
4014974-XXXX*	XXXX*					

90°-90°

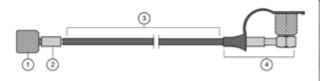
Order Number 4117568-XXXX*



90° to 90°						
Order Number	L (mm)					
4014974-0200	200					
4014974-0300	300					
4014974-0400	400					
4014974-0630	630					
4014974-0800	800					
4014974-1000	1000					
4014974-1500	1500					
4014974-2000	2000					
4014974-XXXX*	XXXX*					

* NOTE: "xxxx" = Assembled hose length in millimeters. Minimum order length is 120 mm. Simply add the hose length onto the Order Number (i.e., 4014974–2500 for a Straight-Straight assembly with a 2500 mm hose length).

Separate Components for EZ Hose System



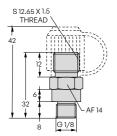
Separate Components for EZ Hose System									
	Order Number Description								
1	EZHF-HOSEEND	Order Ferrule Separately							
2	EZHF-FERRULE	Ferrule							
3	EZH-2 Hose								
4	FZHF-HOSEEND-90	EZHE-HOSEEND-90 Comes with Ferrule and Cap							

All dimensions are in millimeters unless otherwise noted.

Adapters

Charge Port Adapters

Hose adapters are available with three different threads: G 1/8, G 1/4, and 7/16. The G 1/8 is available with and without a check valve. We recommend the version without the check valve for Gas Springs.

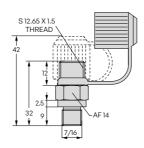


Order Number 4014973-G 1/8

(with check valve)

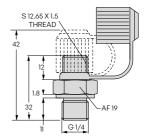
Order Number 4114973-G 1/8

(without check valve)



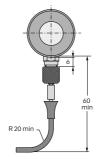
Order Number 4114973-7/16

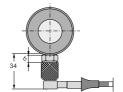
(without check valve)



Order Number 4014973-G 1/4

(with check valve)

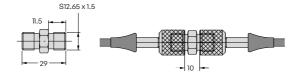




Adapter example with straight and 90° hose

Hose-to-Hose Connector Union

Order Number 503674

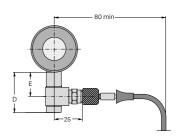


All dimensions are in millimeters unless otherwise noted.

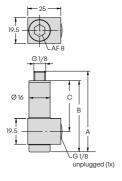


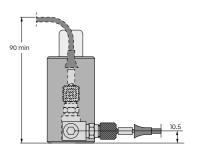
EZ-Hose Adapters for Gas Springs with G 1/8 Port

EZ-Hose Adapters							
Order Number	A mm	B mm	C mm	D mm	E mm	FFC Mounting Limitations	
4016050-01	40	32.5	17	26	11	Cannot be used with FFC mounts.	
4016050-02	54	46.5	31	40.5	25	Can be used only with FFC 500, 750, 1500 & 3000 mounts.	
4016050-03	61	53.5	38	47.5	32	Can be used with all FFC mounts.	



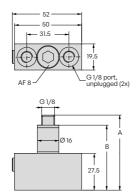
Application Example



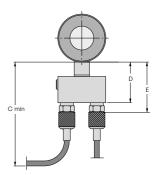


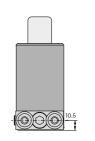
Front Adapter for Gas Springs with G 1/8 Port

Front Adapter							
Order Number	A mm	B mm	C mm	D mm	E mm	FFC Mounting Limitations	
4017314-01	42	34.5	95	28.5	40	Cannot be used with FFC mounts.	
4017314-02	56	48.5	110	42.5	54	Can be used only with FFC 500, 750, 1500 & 3000 mounts.	
4017314-03	63	56.5	115	49.5	61	Can be used with all FFC mounts.	



Application Example

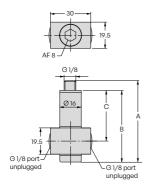




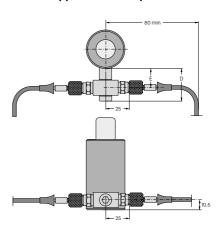
All dimensions are in millimeters unless otherwise noted.

Two-Way Adapter for Gas Springs with G 1/8 Port

Two-Way Adapter							
Order Number	A mm	B mm	C mm	D mm	E mm	FFC Mounting Limitations	
4016051-01	40	32.5	17	26.5	11	Cannot be used with FFC mounts.	
4016051-02	54	46.5	31	40.5	25	Can be used only with FFC 500, 750, 1500 & 3000 mounts.	
4016051-03	61	53.5	38	47.5	32	Can be used with all FFC mounts.	



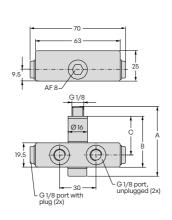
Application Example

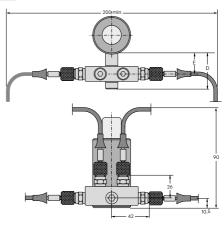


Four-Way Adapter for Gas Springs with G 1/8 Port

Four-Way Adapter								
Order Number	-		C mm	D mm	E mm	FFC Mounting Limitations		
4015035-01	40	32.5	17	26.5	11	Cannot be used with FFC mounts.		
4015035-02	54	46.5	31	40.5	25	Can be used only with FFC 500, 750, 1500 & 3000 mounts.		
4015035-03	61	53.5	38	47.5	32	Can be used with all FFC mounts.		

Application Example





All dimensions are in millimeters unless otherwise noted.

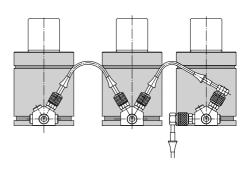


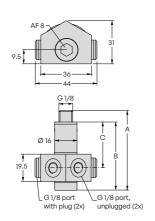
Multi-Way Adapter for Gas Springs with G 1/8 Port

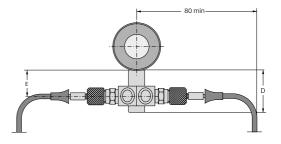
Multi-Way Adapter								
Order A Number mm		B mm	C mm	D mm	E mm	FFC Mounting Limitations		
3017191-01	40	32.5	17	26.5	11	Cannot be used with FFC mounts.		
3017191-02	54	46.5	31	40.5	25	Can be used only with FFC 500, 750, 1500 & 3000 mounts.		
3017191-03	61	53.5	38	47.5	32	Can be used with all FFC mounts.		

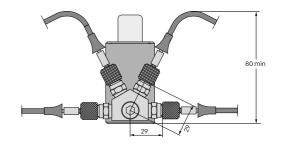
This adapter is ideal when the distance between Gas Springs is short.

Application Example







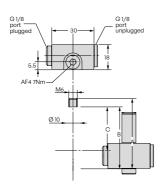


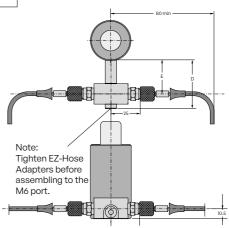
All dimensions are in millimeters unless otherwise noted.

Two-Way Adapter for Gas Springs with M6 Port

Two-Way Adapter for Gas Springs with M6 Port								
Order Number	A mm	B mm	C mm	D mm	E mm	FFC Mounting Limitations		
4023519	36	30	17	25.5	12.5	Can be used only with FFC 500, 750, 1500 & 3000 mounts.		
4023506	49	44	31	39.5 26.5	Can be used with all FFC mounts.			

Application Example





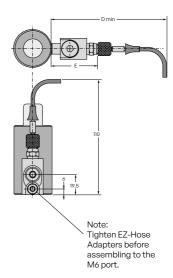
Angle Adapter for Gas Springs with M6 Port

Angle Adapter for Gas Springs with M6 Port								
Order Number	A mm	B mm	C mm	D mm	E mm	FFC Mounting Limitations		
4023520	39	34	18	110	45	Can be used only with FFC 500, 750, 1500 & 3000 mounts.		
4023518	51	46	30	120	57	Can be used with all FFC mounts.		

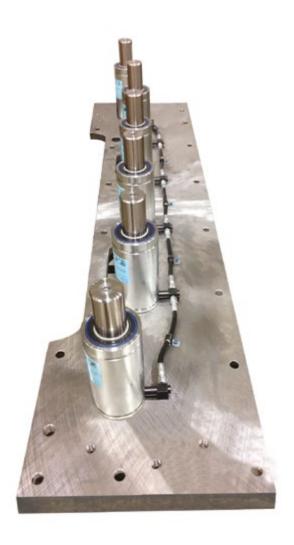
G 1/8 port plugged

All dimensions are in millimeters unless otherwise noted.

Application Example



DualSeal 24™





Hose System

Our most popular Hose System to connect nitrogen Gas Springs, distribution blocks and control panels using an appropriate adapter. It features a DualSeal™ System to ensure double leak-proof joints as well as rotational protection.

All preassembled hose segments are factory crimped and tested for certified sealing.



11mm
Ø5mm
345 bar/5,000 ps
1,380 bar/20,000 psi
40mm
. 120mm (total length assembled)

DualSeal 24™ Cut-to-Length Hose

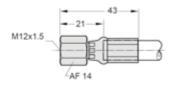
• Meets SAE 100R8 and ISO 3949-2 specifications.

Order Number 502319-L

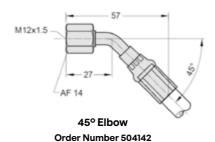
Sold by the millimeter.

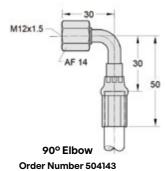


DualSeal 24™ Hose Connections for Crimping



Straight Order Number 504141





DualSeal 24™ Hose Clip

Order Number HC-GM-E024

Secure hoses using an M6 screw.





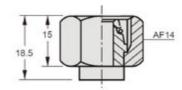
All dimensions are in millimeters unless otherwise noted.



DualSeal 24™ End Cap

Order Number 504913

For capping unused hose connections.



Pre-Assembled Hose Segments / Straight-Straight



Pre-Assembled Hose Segments / Straight-45°

Order Number 3120857-XXXX*



Pre-Assembled Hose Segments / Straight-90°

Order Number 3220857-XXXX*



* Note: "xxxx" = Assembled hose length in millimeters. Minimum order length is 120 mm. Simply add the hose length onto the order number (i.e., 3020857–2500 for a straight-straight assembly with a 2500 mm hose length).

All dimensions are in millimeters unless otherwise noted.

Tube System

The DualSeal 24™ tube features soft sealed and self-crimping connections to ensure leak-proof tube joints. Easily cut into correct lengths, the tube can be bent into the desired shape using a tube bending tool or even by hand.



Tube (available in one meter lengths)

Order Number 505393

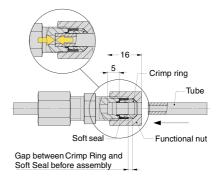


OD	6mm
ID	3mm
Max. Working Pressure	400 bar/5801 ps
Min. Burst Pressure	1400 bar/20305 psi
Min. Bend Radius	18mm
Min. Tube Lenath	75mm

Using the DualSeal 24™ Tube

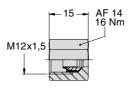
The cutting angle is $90^{\circ} \pm 10$. A hacksaw can be used to cut the tube. If a regular tube cutter or cutting pliers are used, the tube can become clogged limiting gas flow. Deburr the tube inside and out (max. 0.3X45° alt. R0.3) using the tube deburring tool. After cutting and deburring, clean the tube. Use compressed air to remove all loose particles.

Note: Do not tighten! Run the tube through the nut until it stops (\sim 16 mm from the top surface of the nut). When tightening the nut, use a torque of 16 Nm. Recommended tools to have available: hacksaw, tube cutting fixture, tube bending tool, deburring tool, compressed air and a torque wrench (AF 14 mm, 16 Nm).





Tube Deburring Tool Order Number 505096



Functional Nut Order Number 504047



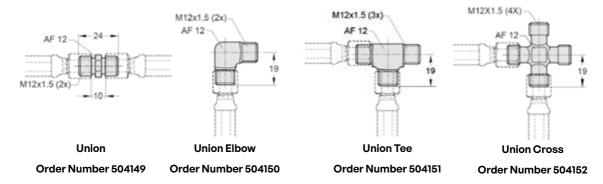
Tube Bending Tool (Bend Radius 20mm)

Order Number 505096

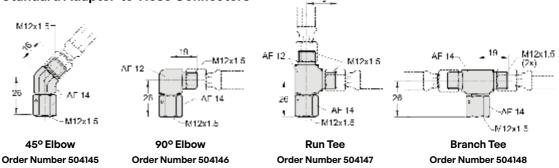


Connectors

Hose-to-Hose Connectors



Standard Adapter-to-Hose Connectors

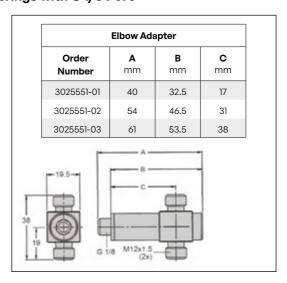


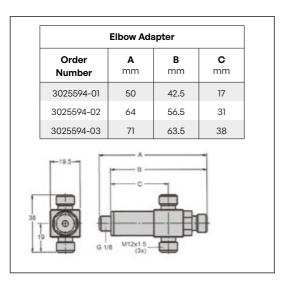
All dimensions are in millimeters unless otherwise noted.

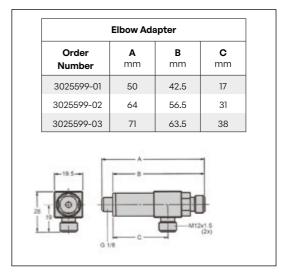
Adapters

Heavy Duty Hose Adapters for Connecting Springs with G 1/8 Port

Elbow Adapter							
Order Number	A mm	B mm	C mm				
3025562-01	40	34.5	17				
3025562-02	54	48.5	31				
3025562-03	61	56.5	38				
19.5 - G 1/8	B-						





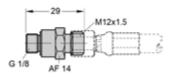




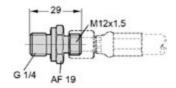
Straight Adapters

The DualSeal 24^{TM} Hose system has M12X1.5 mm threads for connecting the springs, the control panels and the distribution blocks to the hose segments or connectors.

Straight G 1/8 Adapter Order Number 503593



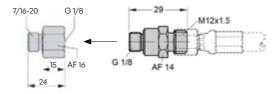
Straight G 1/4 Adapter Order Number 504144



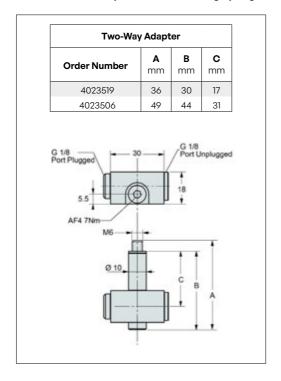
* Note: For applications with SAE-4 ports, utilize combination of adapters 503593 with NF-1600-G 1/8-4.

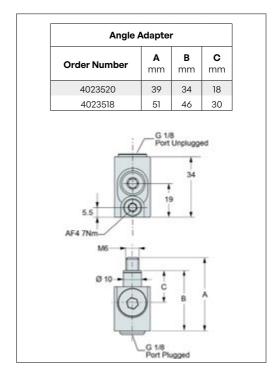
Straight 7/16-20 Adapter Order Number

Straight G 1/8 Adapter Order Number 503593



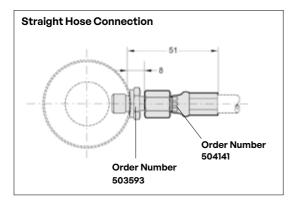
Standard Hose Adapters for Connecting Springs and Distribution Blocks with M6 Ports

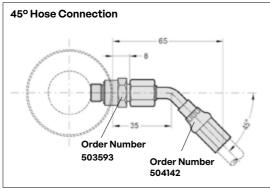


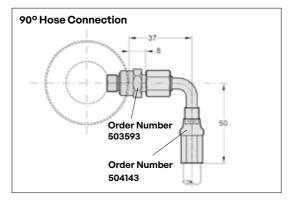


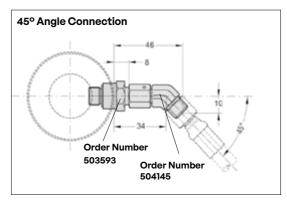
All dimensions are in millimeters unless otherwise noted.

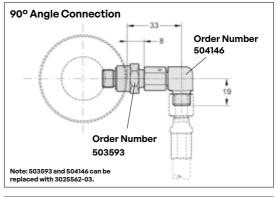
Installation Examples

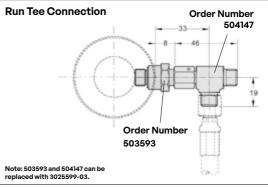


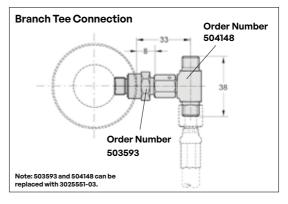












All dimensions are in millimeters unless otherwise noted.

O-Ring Face Seal



Hose System

The O-Ring Face Seal System is used in high vibration applications and systems with high gas flow requirements.

OD	13mm
ID	6.25mm
Max. Working Pressure	345 bar
Min. Burst Pressure	1380 bar
Min. Bend Radius	51mm
Min Crimped Hose Length	150mm (total length with sleeves)



Secure hoses using an M6 screw.

Straight - Straight Order Number ORH-S-S-XXXX



Straight – Straight						
Order Number	L(mm)	L (in)				
ORH-S-S-0200	200	7.87				
ORH-S-S-0300	300	11.81				
ORH-S-S-0400	400	15.75				
ORH-S-S-0630	630	24.80				
ORH-S-S-0800	800	31.50				
ORH-S-S-1000	1000	39.37				
ORH-S-S-1500	1500	59.06				
ORH-S-S-2000	2000	78.74				
ORH-S-S-XXXX	XXXX*	XXXX*				

Straight - 45° Order Number ORH-S-45-XXXX



Straight - 45°						
Order Number	L(mm)	L (in)				
ORH-S-45-0200	200	7.87				
ORH-S-45-0300	300	11.81				
ORH-S-45-0400	400	15.75				
ORH-S-45-0630	630	24.80				
ORH-S-45-0800	800	31.50				
ORH-S-45-1000	1000	39.37				
ORH-S-45-1500	1500	59.06				
ORH-S-45-2000	2000	78.74				
ORH-S-45-XXXX	XXXX*	XXXX*				

Straight – 90° Order Number ORH-S-90-XXXX



Straight - 90°						
Order Number	L(mm)	L (in)				
ORH-S-90-0200	200	7.87				
ORH-S-90-0300	300	11.81				
ORH-S-90-0400	400	15.75				
ORH-S-90-0630	630	24.80				
ORH-S-90-0800	800	31.50				
ORH-S-90-1000	1000	39.37				
ORH-S-90-1500	1500	59.06				
ORH-S-90-2000	2000	78.74				
ORH-S-90-XXXX	XXXX*	XXXX*				

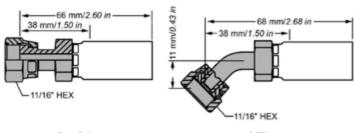
O-Ring Face Seal Hose Order Number ORH-4



^{*} Note: "xxxx" = Assembled hose length in millimeters. Minimum order length is 150mm. Simply add the hose length onto the Order Number (i.e., ORH-S-S-2500 for a Straight-Straight assembly with a 2500mm hose length).

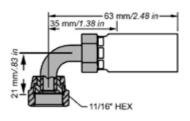
Connectors and Adapters

O-Ring Face Seal Hose Connections for Crimping



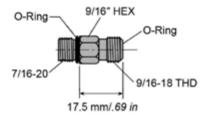
Straight **Order Number ORHF-4**

45° Elbow Order Number ORHF-4500-4

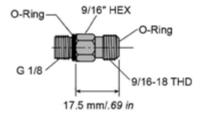


90° Elbow Order Number ORHF-2000-4

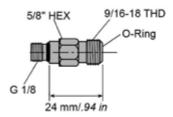
Charge Port Adapters



Straight 7/16-20 Adapter Order Number ORF-1000-4

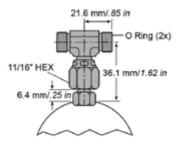


Straight G 1/8 Adapter Order Number ORF-1000-G1/8

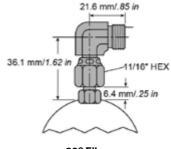


Straight G 1/8 Adapter Order Number 9106252-F

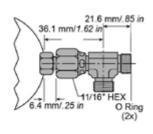
Adapter-to-Hose Connectors



Branch Tee Order Number ORF-3000-4

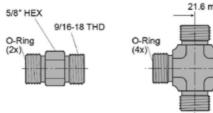


90° Elbow Order Number ORF-2000-4

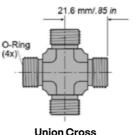


Run Tee Order Number ORF-3300-4

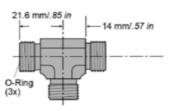
Adapter-to-Hose Connectors



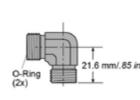
Union Order Number ORF-1100-4



Union Cross Order Number ORF-5500-4



Union Tee Order Number ORF-3500-4



Union Elbow Order Number ORF-2500-4