

# Fittings and Tubing

## Low Pressure

*Pressures to 15,000 psi (1034 bar)*

Since 1945 Autoclave Engineers has designed and built premium quality valves, fittings and tubing. This commitment to engineering and manufacturing excellence has earned Autoclave a reputation for reliable, efficient product performance. Autoclave Engineers has long been established as the world leader in high pressure fluid handling components for the chemical/petrochemical, research, and oil and gas industries.

### *Low Pressure Fittings and Tubing Features:*

- Single-ferrule compression sleeve.
- Fast easy make-up of connection.
- Available sizes are 1/16", 1/8", 1/4", 3/8", & 1/2".
- Fittings manufactured from cold worked 316 stainless steel.
- Tubing is manufactured from annealed stainless steel.
- All items available in special materials.
- Operating temperatures from 0°F (-17.8°C) to 650°F (343°C).
- Molybdenum disulfide-coated gland nuts to prevent galling.

The Low Pressure Series uses Autoclave's SpeedBite connection. This single-ferrule compression sleeve connection delivers fast, easy make-up and reliable bubble-tight performance, in liquid or gas service.



**Autoclave  
Engineers** 

Fluid Components  
Division of Snap-tite, Inc.

[www.autoclave.com](http://www.autoclave.com)

# Fittings and Tubing - Low Pressure Fittings

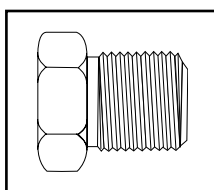
## Pressures to 15,000 psi (1034 bar)

Autoclave Engineers Low Pressure Fittings are designed for use with low pressure valves and tubing. These fittings feature improved SpeedBite compression connections with larger orifices for excellent flow capabilities. Autoclave fittings and components are manufactured of cold-worked type 316 stainless steel. Optional materials are available upon request.

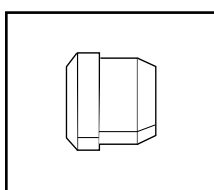


## Connection Components

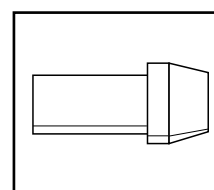
All valves and fittings are supplied complete with appropriate glands and compression sleeves. To order these components separately, use order numbers listed. When using plug, sleeve is not required.



**Gland**  
SMN ( )



**Sleeve**  
SSL ( )



**Plug**  
SP ( )

Add tube size ( )

- 1/8" - 20
- 1/4" - 40
- 3/8" - 60
- 1/2" - 80

† When ordering glands separately for 10V Series 1/4" and 3/8" valves, substitute 10N for SMN.

1/16" tubing system components are available in the mini-fitting series. 1/16" tubing components can be used in 10V Series valves and fittings if required. Consult factory for information on 1/16" tubing assembly in 1/8" tubing components.

Example: 1/4" Gland - SMN 40

Note: Special material glands may be supplied with four flats in place of standard hex.

To ensure proper fit use Autoclave Engineers tubing. For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.

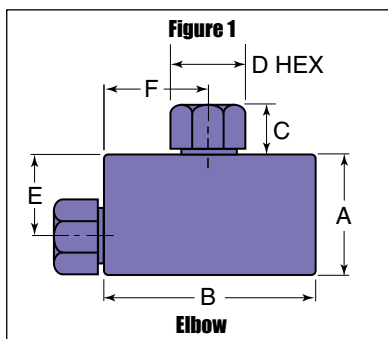
Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

### Elbow

SL2200	W125	1/8 (3.18)	15,000 (1034.19)	0.094 (2.39)	1.00 (25.40)	1.50 (38.10)	0.31 (7.87)	0.50 (12.70)	0.75 (19.05)	0.75 (19.05)		0.62 (15.75)	<b>See Figure 1</b>
SL4400	SW250	1/4 (6.35)	15,000 (1034.19)	0.188 (4.78)	1.38 (35.05)	2.00 (50.80)	0.44 (11.18)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
SL6600	SW375	3/8 (9.53)	15,000 (1034.19)	0.250 (6.35)	1.38 (35.05)	2.00 (50.80)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
SL8800	SW500	1/2 (12.70)	10,000 (689.46)	0.375 (9.53)	1.75 (44.45)	2.50 (63.50)	0.53 (13.46)	0.93 (23.62)	1.25 (31.75)	1.25 (31.75)		1.00 (25.40)	

\*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change. For prompt service, Autoclave stocks select products. Consult your local representative.



Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

**Tee**

ST2220	W125	1/8 (3.18)	15,000 (1034.19)	0.094 (2.39)	1.00 (25.40)	1.50 (38.10)	0.31 (7.87)	0.50 (12.70)	0.75 (19.05)	0.75 (19.05)		0.62 (15.75)	See Figure 2
ST4440	SW250	1/4 (6.35)	15,000 (1034.19)	0.188 (4.78)	1.38 (35.05)	2.00 (50.80)	0.44 (11.18)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
ST6660	SW375	3/8 (9.53)	15,000 (1034.19)	0.250 (6.35)	1.38 (35.05)	2.00 (50.80)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
ST8880	SW500	1/2 (12.70)	10,000 (689.46)	0.375 (9.53)	1.75 (44.45)	2.50 (63.50)	0.53 (13.46)	0.93 (23.62)	1.25 (31.75)	1.25 (31.75)		1.00 (25.40)	

**Cross**

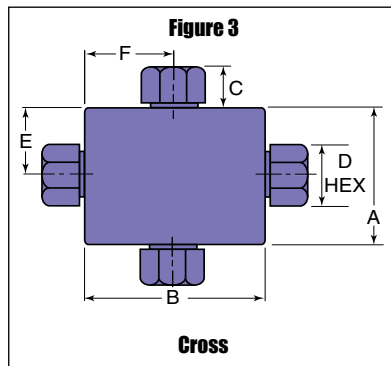
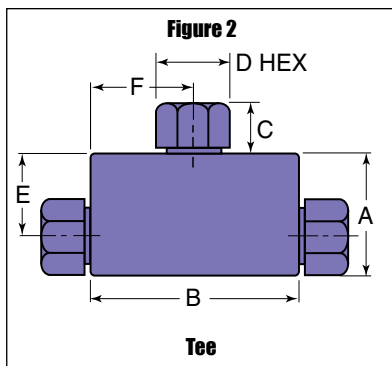
SX2222	W125	1/8 (3.18)	15,000 (1034.19)	0.094 (2.39)	1.50 (38.10)	1.50 (38.10)	0.31 (7.87)	0.50 (12.70)	0.75 (19.05)	0.75 (19.05)		0.62 (15.75)	See Figure 3
SX4444	SW250	1/4 (6.35)	15,000 (1034.19)	0.188 (4.78)	2.00 (50.80)	2.00 (50.80)	0.44 (11.18)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
SX6666	SW375	3/8 (9.53)	15,000 (1034.19)	0.250 (6.35)	2.00 (50.80)	2.00 (50.80)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	
SX8888	SW500	1/2 (12.70)	10,000 (689.46)	0.375 (9.53)	2.50 (63.50)	2.50 (63.50)	0.53 (13.46)	0.93 (23.62)	1.25 (31.75)	1.25 (31.75)		1.00 (25.40)	

**Straight Coupling**

15F2211	W125	1/8 (3.18)	15,000 (1034.19)	0.094 (2.39)	0.50 (12.70)	1.25 (31.75)	0.31 (7.87)	0.50 (12.70)					See Figure 4
6F4422	SW250	1/4 (6.35)	15,000 (1034.19)	0.188 (4.78)	0.62 (15.75)	1.62 (41.15)	0.44 (11.18)	0.63 (15.88)					
6F6622	SW375	3/8 (9.53)	15,000 (1034.19)	0.250 (6.35)	0.75 (19.05)	1.75 (44.45)	0.53 (13.46)	0.75 (19.05)					
4F8822	SW500	1/2 (12.70)	10,000 (689.46)	0.375 (9.53)	1.00 (25.40)	2.00 (50.80)	0.53 (13.46)	0.93 (23.62)					

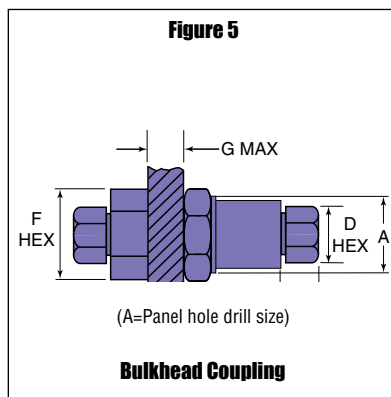
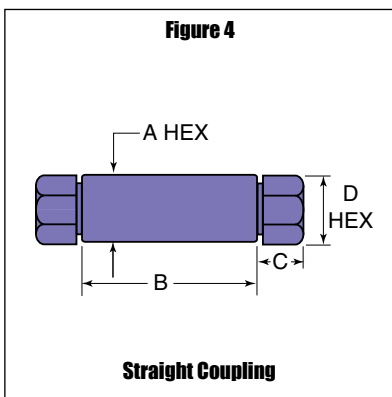
**Bulkhead Coupling**

15BF2211	W125	1/8 (3.18)	15,000 (1034.19)	0.094 (2.39)	0.690 (17.53)	1.75 (44.45)	0.31 (7.87)	0.50 (12.70)	0.38 (9.65)	0.75 (19.05)	0.38 (9.65)		See Figure 5
6BF4422	SW250	1/4 (6.35)	15,000 (1034.19)	0.188 (4.78)	0.940 (23.88)	1.88 (47.75)	0.44 (11.18)	0.63 (15.88)	0.50 (12.70)	1.00 (25.40)	0.38 (9.65)		
6BF6622	SW375	3/8 (9.53)	15,000 (1034.19)	0.250 (6.35)	0.940 (23.88)	1.88 (47.75)	0.53 (13.46)	0.75 (19.05)	0.50 (12.70)	1.00 (25.40)	0.38 (9.65)		
4BF8822	SW500	1/2 (12.70)	10,000 (689.46)	0.375 (9.53)	1.120 (28.45)	2.38 (60.45)	0.53 (13.46)	0.93 (23.62)	0.78 (19.81)	1.38 (35.05)	0.38 (9.65)		



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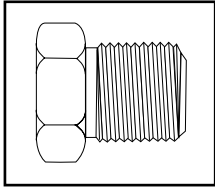


(A=Panel hole drill size)

# Fittings and Tubing - Mini Series Fittings

**Pressure to 15,000 psi (1034 bar)**

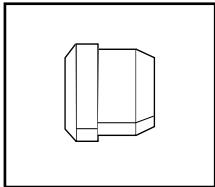
All Autoclave Engineers valves and fittings are supplied complete with appropriate glands and compression sleeves. To order these components separately, use order numbers listed. When using plug, sleeve is not required.



**Gland**  
SMN ( )

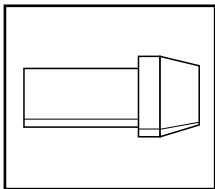
Add gland size ( ) Example: SMN - 10-38  
 1/16" - 10-38  
 1/16" - 10-10mm  
 1/8" - 20-38  
 1/8" - 20-10mm

Note: Gland sizes differ as follows:  
 38 is 3/8 hex



**Sleeve**  
SSL ( )

Add tube size for sleeve and plug ( ) Example: 1/8" Sleeve SSL20  
 1/16" - 10  
 1/8" - 20



**Plug**  
SP ( )

Note: Special material glands may be supplied with four flats in place of standard hex.

Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F			

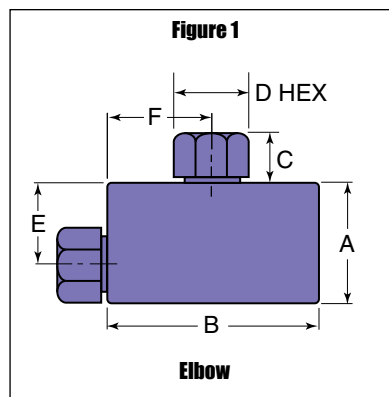
## Elbow

### 3/8 inch hex glands (D Dimension)

MLE1100	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.00 (25.40)	1.00 (25.40)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	See Figure 1
MLE2200	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.00 (25.40)	1.00 (25.40)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
10 millimeter hex glands (D Dimension)													
ML1100	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.00 (25.40)	1.00 (25.40)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
ML2200	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.00 (25.40)	1.00 (25.40)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	

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Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F			

### Tee

3/8 inch hex glands (D Dimension)

MTE1110	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.00 (25.40)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	See Figure 2
MTE2220	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.00 (25.40)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
10 millimeter hex glands (D Dimension)													
MT1110	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.00 (25.40)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
MT2220	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.00 (25.40)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	

### Cross

3/8 inch hex glands (D Dimension)

MXE1111	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.38 (34.93)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	See Figure 3
MXE2222	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.38 (34.93)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
10 millimeter hex glands (D Dimension)													
MX1111	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	1.38 (34.93)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	
MX2222	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	1.38 (34.93)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)	0.69 (17.45)	0.69 (17.45)		0.56 (14.27)	

### Straight Couplings

3/8 inch hex glands (D Dimension)

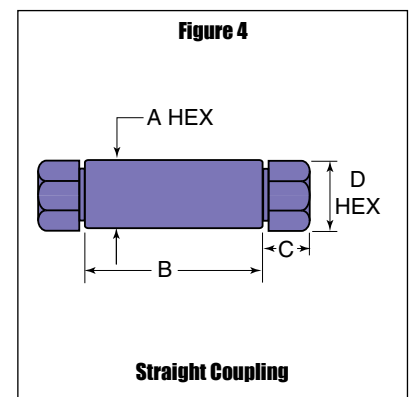
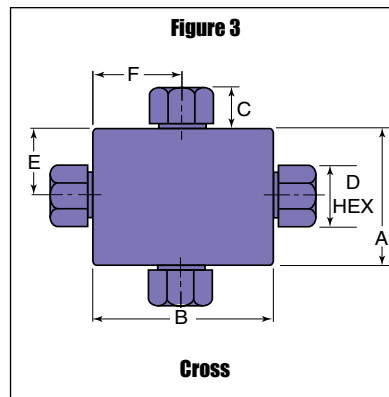
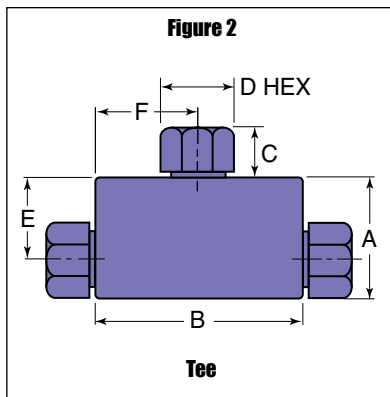
MCE1100	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	0.63 (15.88)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)					See Figure 4
MCE2200	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	0.63 (15.88)	1.38 (34.93)	0.31 (7.87)	0.38 (9.65)					
10 millimeter hex glands (D Dimension)													
MC1100	W062	1/16 (1.59)	15,000 (1034.20)	0.055 (1.40)	0.63 (15.88)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)					
MC2200	W125	1/8 (3.18)	15,000 (1034.20)	0.093 (2.36)	0.63 (15.88)	1.38 (34.93)	0.31 (7.87)	0.39 (10.00)					

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Actual working pressure may be determined by tubing pressure rating, if lower.

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# Fittings and Tubing - Low Pressure Tubing

**Pressures to 15,000 psi (1034 bar)**



Autoclave Engineers offers a complete selection of annealed, seamless stainless steel tubing designed to match the performance standards of Autoclave low pressure valves and fittings. Autoclave low pressure tubing is furnished in random lengths between 20 feet (6 meters) and 27 feet (8.2 meters). The average is 24 feet (7.3 meters). The tubing is available in five sizes and a variety of materials. In order to ensure proper sleeve “bite” into tubing, Autoclave Engineers specifies and controls the strength levels of both the tube and sleeve materials.

## Inspection and Testing

Autoclave Engineers low pressure tubing is inspected for compliance with specified defect restrictions as well as carburization or intergranular carbide precipitation. The tubing outside diameter and wall thickness is controlled within close tolerance to assure proper fit. Sample pieces of tube (for each lot) are tested to confirm mechanical properties for proper compression sleeve “bite” and pressure capability. Furthermore, the sample tubes are pressure tested as a final check.

## Special Materials

In addition to the type 316 and 304 stainless steel tubing listed in this section, Autoclave has a limited stock of hard-to-obtain shorter lengths of the following tubing materials:

*Monel 400\**, *Inconel 600\**, *Titanium Grade 2\**, *Nickel 200\**, *Hastelloy C276\** - (\* Trademark names)

Please consult factory for stock availability.

## Tubing Tolerance

Nominal Tubing Size inches (mm)	Tolerance/Outside Diameter inches (mm)
1/16 (1.59)	.064/.062 (1.62/1.57)
1/8 (3.18)	.128/.125 (3.25/3.18)
1/4 (6.35)	.254/.250 (6.45/6.35)
3/8 (9.53)	.379/.375 (9.74/9.53)
1/2 (12.70)	.505/.500 (12.83/12.70)

Catalog Number	Tube Materials	Fits Connection Type	Tube Size Inches (mm)			Flow Area in. <sup>2</sup> (mm <sup>2</sup> )	Working Pressure psi (bar)*				
			Outside Diameter	Inside Diameter	Wall Thickness		0 - 100°F -17.8 to -37.8°C	200°F 93°C	400°F 204°C	600°F 316°C	650°F 343°C
MS15-070	316SS	W125	1/16 <b>(1.59)</b>	0.026 <b>(0.66)</b>	0.018 <b>(0.46)</b>	0.0005 <b>(0.32)</b>	15,000 <b>(1034.20)</b>	15,000 <b>(1034.20)</b>	14,400 <b>(992.83)</b>	13,600 <b>(937.67)</b>	12,600 <b>(868.73)</b>
MS15-200	316SS	W125	1/8 <b>(3.18)</b>	0.052 <b>(1.32)</b>	0.036 <b>(0.91)</b>	0.002 <b>(1.29)</b>	15,000 <b>(1034.20)</b>	15,000 <b>(1034.20)</b>	14,400 <b>(992.83)</b>	13,600 <b>(937.67)</b>	12,600 <b>(868.73)</b>
MS15-151	304SS			0.062 <b>(1.57)</b>	0.032 <b>(0.81)</b>	0.003 <b>(1.94)</b>	11,650 <b>(803.23)</b>	11,050 <b>(751.85)</b>	10,050 <b>(692.91)</b>	9,900 <b>(682.57)</b>	9,850 <b>(679.12)</b>
MS15-051	316SS			0.062 <b>(1.57)</b>	0.032 <b>(0.81)</b>	0.003 <b>(1.94)</b>	11,650 <b>(803.23)</b>	11,650 <b>(803.23)</b>	11,250 <b>(775.65)</b>	10,600 <b>(730.83)</b>	9,850 <b>(679.12)</b>
MS15-166	304SS			0.069 <b>(1.75)</b>	0.028 <b>(0.71)</b>	0.004 <b>(2.58)</b>	9,950 <b>(686.02)</b>	9,400 <b>(648.10)</b>	8,550 <b>(589.49)</b>	8,450 <b>(582.60)</b>	8,000 <b>(551.57)</b>
MS15-150	304SS			0.085 <b>(2.16)</b>	0.020 <b>(0.51)</b>	0.006 <b>(3.87)</b>	6,850 <b>(472.28)</b>	6,500 <b>(448.15)</b>	5,900 <b>(406.78)</b>	5,800 <b>(399.89)</b>	5,500 <b>(379.21)</b>
MS15-154	304SS			W250 or SW250	1/4 <b>(6.35)</b>	0.125 <b>(3.18)</b>	0.062 <b>(1.57)</b>	0.012 <b>(7.74)</b>	11,650 <b>(803.23)</b>	11,650 <b>(761.86)</b>	10,050 <b>(692.91)</b>
MS15-055	316SS	0.125 <b>(3.18)</b>	0.062 <b>(1.57)</b>			0.012 <b>(7.74)</b>	11,650 <b>(803.23)</b>	11,650 <b>(761.86)</b>	11,250 <b>(775.65)</b>	10,600 <b>(730.83)</b>	9,850 <b>(679.12)</b>
MS15-161	304SS	0.180 <b>(4.57)</b>	0.035 <b>(0.89)</b>			0.026 <b>(16.77)</b>	5,450 <b>(375.76)</b>	5,150 <b>(355.07)</b>	4,700 <b>(324.05)</b>	4,600 <b>(317.15)</b>	4,400 <b>(303.36)</b>
MS15-069	316SS	0.180 <b>(4.57)</b>	0.035 <b>(0.89)</b>			0.026 <b>(16.77)</b>	5,450 <b>(375.76)</b>	5,450 <b>(375.76)</b>	5,250 <b>(361.97)</b>	4,950 <b>(341.29)</b>	4,600 <b>(317.15)</b>
MS15-158	304SS	0.194 <b>(4.93)</b>	0.028 <b>(0.71)</b>			0.029 <b>(18.71)</b>	4,600 <b>(317.15)</b>	4,350 <b>(299.92)</b>	3,950 <b>(272.34)</b>	3,900 <b>(272.34)</b>	3,700 <b>(255.10)</b>
MS15-203	316SS	0.084 <b>(2.13)</b>	0.083 <b>(2.11)</b>			0.029 <b>(18.71)</b>	15,000 <b>(1034.16)</b>	15,000 <b>(1034.16)</b>	14,400 <b>(992.83)</b>	13,600 <b>(937.67)</b>	12,600 <b>(868.73)</b>
MS15-206	304SS	0.084 <b>(2.13)</b>	0.083 <b>(2.11)</b>			0.029 <b>(18.71)</b>	15,000 <b>(1034.16)</b>	14,225 <b>(980.76)</b>	12,940 <b>(892.17)</b>	12,745 <b>(877.82)</b>	12,680 <b>(874.24)</b>
MS15-084	316SS	W375 or SW375	3/8 <b>(9.53)</b>			0.195 <b>(4.95)</b>	0.090 <b>(2.29)</b>	0.030 <b>(19.35)</b>	10,000 <b>(689.46)</b>	10,000 <b>(689.46)</b>	9,650 <b>(665.33)</b>
MS15-184	304SS			0.195 <b>(4.95)</b>	0.090 <b>(2.29)</b>	0.030 <b>(19.35)</b>	10,000 <b>(689.46)</b>	9,400 <b>(648.10)</b>	8,600 <b>(592.94)</b>	8,500 <b>(586.05)</b>	8,450 <b>(582.60)</b>
MS15-155	304SS			0.250 <b>(6.35)</b>	0.062 <b>(1.57)</b>	0.049 <b>(31.61)</b>	7,500 <b>(517.10)</b>	7,100 <b>(489.52)</b>	6,450 <b>(444.70)</b>	6,350 <b>(437.81)</b>	6,050 <b>(417.13)</b>
MS15-062	316SS			0.250 <b>(6.35)</b>	0.062 <b>(1.57)</b>	0.049 <b>(31.61)</b>	7,500 <b>(517.10)</b>	7,500 <b>(517.10)</b>	7,200 <b>(496.41)</b>	6,800 <b>(468.84)</b>	6,300 <b>(434.36)</b>

Catalog Number	Tube Materials	Fits Connection Type	Tube Size Inches (mm)			Flow Area in. <sup>2</sup> (mm <sup>2</sup> )	Working Pressure psi (bar)*				
			Outside Diameter	Inside Diameter	Wall Thickness		0 - 100°F -17.8 to -37.8°C	200°F 93°C	400°F 204°C	600°F 316°C	650°F 343°C
MS15-164	304SS	W375 or SW375	3/8 (9.53)	0.277 (7.04)	0.049 (1.24)	0.060 (38.71)	5,450 (375.76)	5,150 (355.07)	4,700 (324.05)	4,600 (317.15)	4,400 (303.36)
MS15-162	304SS			0.305 (7.75)	0.035 (0.89)	0.073 (47.10)	3,800 (262.00)	3,550 (244.76)	3,250 (224.08)	3,200 (220.63)	3,050 (210.29)
MS15-204	316SS			0.139 (3.53)	0.118 (3.00)	0.073 (47.10)	15,000 (1034.16)	15,000 (1034.16)	14,400 (992.83)	13,600 (937.67)	12,600 (868.73)
MS15-207	304SS			0.139 (3.53)	0.118 (3.00)	0.073 (47.10)	15,000 (1034.16)	14,225 (980.76)	12,940 (892.17)	12,745 (878.72)	12,680 (874.24)
MS15-157	304SS	W500 or SW500	1/2 (12.70)	0.375 (9.53)	0.062 (1.57)	0.110 (70.97)	5,500 (379.21)	5,150 (355.07)	4,700 (324.05)	4,600 (317.15)	4,400 (303.36)
MS15-065	316SS			0.375 (9.53)	0.062 (1.57)	0.110 (70.97)	5,500 (379.21)	5,500 (379.21)	5,250 (361.97)	4,950 (341.29)	4,600 (317.15)
MS15-165	304SS			0.402 (10.21)	0.048 (1.22)	0.127 (81.94)	4,000 (275.79)	3,750 (258.55)	3,400 (234.42)	3,400 (234.42)	3,200 (220.63)
MS15-205	316SS			0.264 (6.71)	0.118 (3.00)	0.127 (81.94)	10,000 (689.46)	10,000 (689.46)	9,650 (665.33)	9,000 (620.52)	8,400 (579.15)
MS15-208	304SS			0.264 (6.71)	0.118 (3.00)	0.127 (81.94)	10,000 (689.46)	9,400 (648.10)	8,600 (592.94)	8,500 (586.05)	8,450 (582.60)

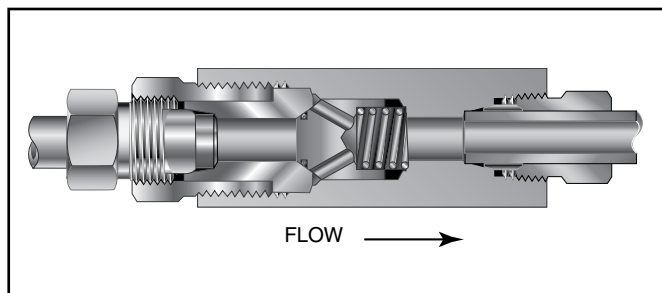
\*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change. For prompt service, Autoclave stocks select products. Consult your local representative.

## Fittings and Tubing - Low Pressure Check Valves

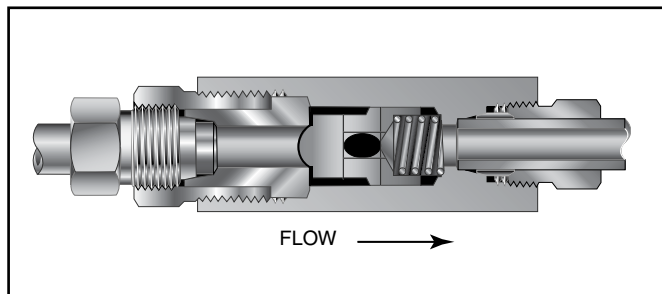
### Pressures to 15,000 psi (1034 bar)

#### O-Ring Check Valves



Minimum operating temperature for standard o-ring check valves 0°F (17.8°C). For low temperature option to -423°F (-252°C) add suffix LTTO (Low temperature spring & Teflon o-ring).

#### Ball Check Valves



Minimum operating temperature for standard ball check valves -110° (-79°C). For low temperature option to -423°F (-252°C) add suffix LT (Low temperature spring).

Provide unidirectional flow and tight shut-off for liquids and gases with high reliability. When differential drops below cracking pressure\*, valve shuts off. **(Not for use as relief valve.)**

**Materials:** 316 Stainless Steel: body, cover, poppet and cover gland. 300 Series Stainless Steel: spring Standard O-ring: Viton, for operation to 500° F (260°C). Buna-N or Teflon available for 250°F (121°C) or 400°F (204°C) respectively; specify when ordering.

\***Cracking Pressure:** 20 psi (1.38 bar) ±30%. Springs for higher cracking pressures (up to 100 psi (6.89bar)) available on special order for O-ring style check valves only.

Prevent reverse flow where leak-tight shut-off is not mandatory. When differential drops below cracking pressure, valve closes. With all-metal components, valve can be used up to 650°F (343°C). See Technical Information section for connection temperature limitations. **(Not for use as a relief valve.)**

**Ball and poppet are an integral design** to assure positive, in-line seating without “chatter”. Poppet is designed essentially for axial flow with minimum pressure drop.

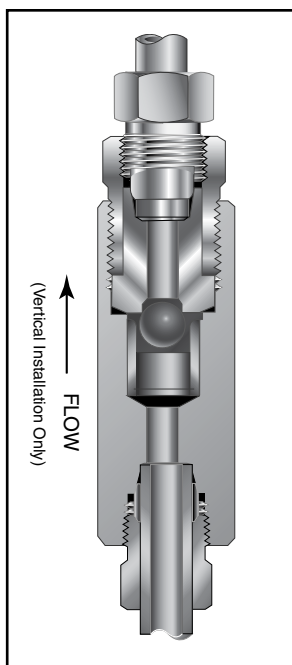
**Materials:** 316 Stainless Steel: body, cover, cover gland, ball poppet. 300 Series Stainless Steel: spring

**CAUTION:** While testing has shown O-Rings to provide satisfactory service life, both cyclic and shelf life may vary widely with differing service conditions, properties of reactants, pressure and temperature cycling and age of the O-ring. FREQUENT INSPECTIONS SHOULD BE MADE to detect any deterioration, and O-rings replaced as required.

**CAUTION:** See Tubing section for proper selection of tubing.  
**NOTE:** For optional material see Needle Valve Options section.



## Ball Type Excess Flow Valves



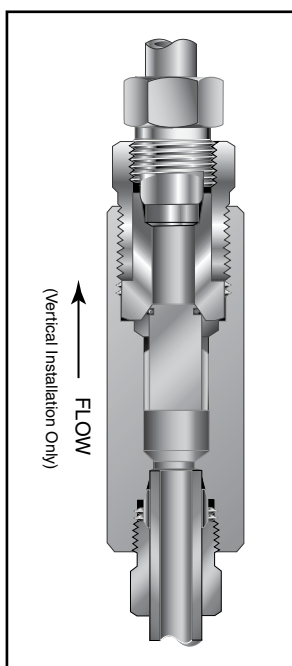
Protects pressure gauges and pressure instrumentation from sudden surges in flow or venting in the event of line failure.

**Materials:** 316 Stainless Steel: body, cover, gland nut and sleeve. 300 Series Stainless Steel: ball

**Vertical Installation:** Since this type of check valve employs a non-spring loaded ball, valve **MUST** be installed in VERTICAL position with arrow on valve body pointing UP. (cover gland up).

**Resetting Valve:** Equalize the pressure across the ball. The ball will drop and reset automatically.

## O-Ring Type Excess Flow Valves



Protects pressure gauges and other pressure instrumentation from sudden surges in flow due to operator error or line failure. This valve provides dependable, tight shut-off.

**Materials:** 316 Stainless Steel: body, cover and sleeve. O-Ring: Viton for operation to 500°F (260°C). Buna-N or Teflon available for 250°F (121°C) or 400°F (204°C) respectively; specify when ordering.

**Vertical Installation:** Since this type of check valve employs a non-spring loaded poppet, valve **MUST** be installed in VERTICAL position with arrow on valve body pointing UP. (cover gland up).

**Resetting Valve:** Equalize the pressure across the poppet. The poppet will drop and reset automatically.

**CAUTION:** While testing has shown O-Rings to provide satisfactory service life, both cyclic and shelf life may vary widely with differing service conditions, properties of reactants, pressure and temperature cycling and age of the O-ring. FREQUENT INSPECTIONS SHOULD BE MADE to detect any deterioration, and O-rings replaced as required.

**CAUTION:** See Tubing section for proper selection of tubing.  
**NOTE:** For optional material see Needle Valve Options section.



# Fittings and Tubing - Low Pressure Check Valves

Catalog Number	Fits Connection Type	Pressure Rating psi (bar)*	Orifice inches (mm)	Rated C <sub>v</sub>	Dimensions - inches (mm)					Fitting Pattern
					A	B	C	D Typical	Hex	

## O-Ring Check Valves

SW02200	W125	15,000 (1034.19)	0.094 (2.39)	0.15	2.25 (57.15)	1.88 (47.75)	0.31 (7.87)	0.50 (12.70)	0.63 (15.88)	See Figure 1
SW04400	SW250	15,000 (1034.19)	0.188 (4.78)	0.63	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	
SW06600	SW375	15,000 (1034.19)	0.250 (6.35)	1.70	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
SW08800	SW500	10,000 (689.46)	0.375 (9.53)	3.40	4.18 (106.17)	3.50 (88.90)	0.53 (13.46)	0.93 (23.62)	1.38 (35.05)	

## Ball Check Valves

SWB2200	W125	15,000 (1034.19)	0.094 (2.39)	0.15	2.25 (57.15)	1.88 (47.75)	0.31 (7.87)	0.50 (12.70)	0.63 (15.88)	See Figure 1
SWB4400	SW250	15,000 (1034.19)	0.188 (4.78)	0.63	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	
SWB6600	SW375	15,000 (1034.19)	0.250 (6.35)	1.70	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
SWB8800	SW500	10,000 (689.46)	0.375 (9.53)	3.40	4.18 (106.17)	3.50 (88.90)	0.53 (13.46)	0.93 (23.62)	1.38 (35.05)	

## Ball Type Excess Flow Valves

SWK2202	W125	15,000 (1034.19)	0.094 (2.39)	0.012+	2.25 (57.15)	1.88 (47.75)	0.31 (7.87)	0.50 (12.70)	0.63 (15.88)	See Figure 1
SWK4402	SW250	15,000 (1034.19)	0.188 (4.78)	0.037+	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	
SWK6602	SW375	15,000 (1034.19)	0.250 (6.35)	0.104+	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
SWK8802	SW500	10,000 (689.46)	0.375 (9.53)	0.212+	4.18 (106.17)	3.50 (88.90)	0.53 (13.46)	0.93 (23.62)	1.38 (35.05)	

## O-Ring Type Excess Flow Valves

SWK04400	SW-250	15,000 (1034.19)	0.188 (4.78)	3++	3.12 (79.25)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	See Figure 1
SWK06600	SW-375	15,000 (1034.19)	0.250 (6.35)	5++	3.50 (88.90)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
SWK08800	SW-500	10,000 (689.46)	0.375 (9.53)	10++	4.31 (109.47)	3.50 (88.90)	0.53 (13.46)	0.93 (23.62)	1.38 (35.05)	

### Note:

All check valves are furnished complete with connection components unless otherwise specified.

The 1/16" Tubing System is a complete system for use with all 1/8" components for pressure to 15,000 psi (1034 bar). Consult factory.

+ - Check Flow\*\* - water, GPM

++ - Check Flow\*\* - CFM, nitrogen @ 500 psi (34.47 bar), RT

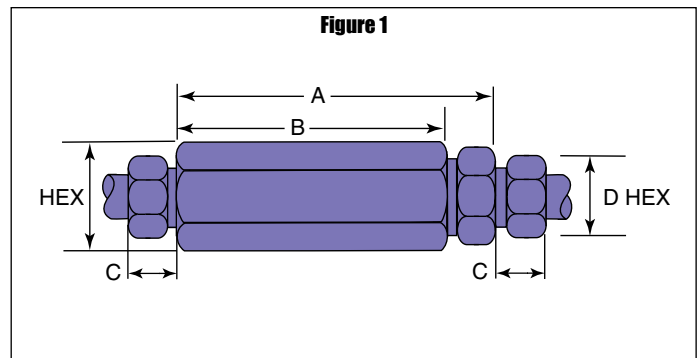
\*\* - For flow using alternate fluids, consult Autoclave Engineers.

\*Maximum pressure rating is based on the lowest rating of any component.

Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change.

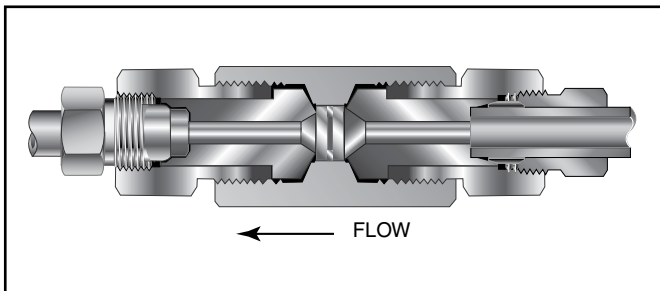
For prompt service, Autoclave stocks select products. Consult your local representative.



# Fittings and Tubing - Low Pressure Line Filters

Pressures to 15,000 psi (1034 bar)

## Dual-Disc Line Filters

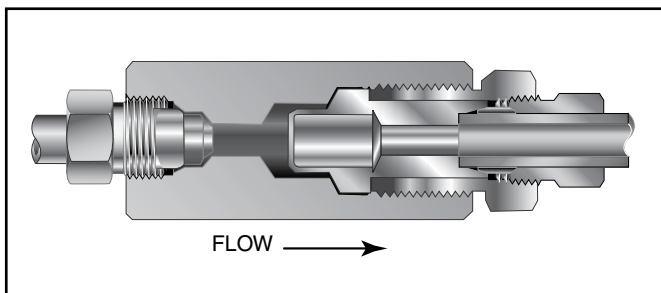


Dual-Disc Line Filters are utilized in numerous industrial, chemical processing, aerospace, nuclear and other applications. With the dual-disc design, large contaminant particles are trapped by the upstream filter element before they can reach and clog the smaller micron-size downstream element. Filter elements can be easily replaced.

**Materials:** 316 Stainless Steel: Body, covers and gland nuts. Filters: 316L Stainless Steel.

**Filter Elements:** Downstream/upstream micron size 35/65 is standard. 5/10 or 10/35 also available when specified. Other element combinations available on special order.

## Cup-Type Line Filters



High Flow Cup-Type Line Filters are recommended in low pressure systems requiring both high flow rates and maximum filter surface area. Widely used in the industrial and chemical processing fields, the cup design offers as much as six times the effective filter area as compared to disc-type units. In addition, the filter elements can be quickly and easily replaced.

**Materials:** 316 Stainless Steel: Body, covers and gland nuts. Filter: 316L Stainless Steel.

**Filter Elements:** 300 Series Stainless Steel sintered cup. Standard elements available in choice of 5, 35 or 65 micron sizes. **Note:** Filter ratings are nominal.

**NOTE 1:** All filters furnished complete with connection components unless otherwise specified. All dimensions for reference only and subject to change. For optional materials, see Needle Valve Options section

**NOTE 2:** Autoclave Engineers disc and cup type filters are designed to filter small amounts of process particles. It is recommended that all fluids are thoroughly cleaned prior to entering the higher pressure system.

**NOTE 3:** Special material filters may be supplied with four flats in place of standard hex.

**NOTE 4:** Pressure differential not to exceed 1,000 psi (69 bar) in a flowing condition.

# Fittings and Tubing - Low Pressure Line Filters

Catalog Number	Pressure Rating psi (bar)*	Orifice inches (mm)	Micron Size**	Connection Size and Type	Effective Filter Element Area in. <sup>2</sup> (mm <sup>2</sup> )	Dimensions - inches (mm)				
						A	B	C	D Typical	Hex

## Dual-Disc Line Filters

SLF2200	15,000 (1034.19)	.094 <b>(2.39)</b>	35/65	W125	.06 <b>(38.70)</b>	2.31 <b>(58.67)</b>	1.25 <b>(31.75)</b>	0.31 <b>(7.87)</b>	.50 <b>(12.70)</b>	0.62 <b>(15.74)</b>
SLF2200-5/10			5/10							
SLF2200-10/35			10/35							
SLF4400	15,000 (1034.19)	.125 <b>(3.18)</b>	35/65	SW250	.15 <b>(96.77)</b>	2.94 <b>(75.56)</b>	1.68 <b>(42.67)</b>	0.44 <b>(11.17)</b>	.63 <b>(15.88)</b>	0.81 <b>(20.57)</b>
SLF4400-5/10			5/10							
SLF4400-10/35			10/35							
SLF6600	15,000 (1034.19)	.125 <b>(3.18)</b>	35/65	SW375	.15 <b>(96.77)</b>	2.94 <b>(75.56)</b>	1.68 <b>(42.67)</b>	0.53 <b>(13.46)</b>	.75 <b>(19.05)</b>	1.00 <b>(25.40)</b>
SLF6600-5/10			5/10							
SLF6600-10/35			10/35							
SLF8800	10,000 (689.46)	.188 <b>(4.78)</b>	35/65	SW500	.25 <b>(161.29)</b>	3.56 <b>(90.42)</b>	1.94 <b>(49.27)</b>	0.53 <b>(13.46)</b>	.93 <b>(23.62)</b>	1.18 <b>(29.97)</b>
SLF8800-5/10			5/10							
SLF8800-10/35			10/35							

## Cup-Type Line Filters

SWF4-5	15,000 (1034.19)	.188 <b>(4.78)</b>	5	SW250	0.81 <b>(522.57)</b>	3.18 <b>(80.77)</b>	2.56 <b>(65.02)</b>	0.44 <b>(11.17)</b>	0.63 <b>(15.88)</b>	0.81 <b>(20.57)</b>
SWF4-35			35							
SWF4-65			65							
SWF6-5	15,000 (1034.19)	.312 <b>(7.92)</b>	5	SW375	0.81 <b>(522.57)</b>	3.56 <b>(90.42)</b>	3.00 <b>(76.20)</b>	0.53 <b>(13.46)</b>	0.75 <b>(19.05)</b>	1.00 <b>(25.40)</b>
SWF6-35			35							
SWF6-65			65							
SWF8-5	10,000 (689.46)	.438 <b>(11.13)</b>	5	SW500	1.53 <b>(987.09)</b>	4.18 <b>(106.17)</b>	3.50 <b>(88.90)</b>	0.53 <b>(13.46)</b>	.93 <b>(23.62)</b>	1.38 <b>(35.05)</b>
SWF8-35			35							
SWF8-65			65							

\*\* Larger micron size filter element is installed on upstream (inlet) side. All filters furnished complete with connection components unless otherwise specified.

Other micron sizes available on special order. Change last digits of the catalog number accordingly. For optional materials, see Needle Valve Options section.

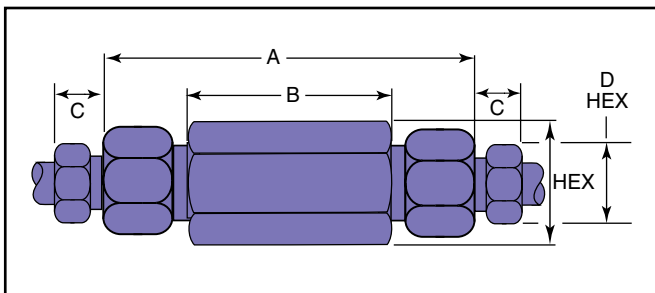
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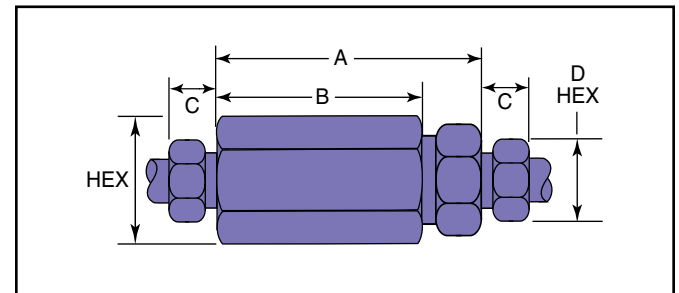
All dimensions for reference only and subject to change.

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## Dual-Disc Line Filters



## Cup-Type Line Filters



All general terms and conditions of sale, including limitations of our liability, apply to all products and services sold.

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